DOCUMENT RESUME

ED 410 259 TM 027 029

TITLE	Diploma Examinations Program, 1995-96 School Year. Annual Report.
INSTITUTION	Alberta Dept. of Education, Edmonton.
REPORT NO	ISSN-1185-2364
PUB DATE	97
NOTE	74p.
AVAILABLE FROM	Student Evaluation Branch, Alberta Education, 11160 Jasper Avenue, Edmonton, Alberta, T5K 0L2, Canada.
PUB TYPE	Numerical/Quantitative Data (110) -- Reports - Descriptive (141)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*Academic Achievement; Foreign Countries; *Graduation Requirements; *High School Students; High Schools; Program Effectiveness; Reentry Students; School Districts; Sex Differences; Standards; *State Programs; Test Construction
IDENTIFIERS	*Alberta Grade Twelve Diploma Examinations; *Exit Examinations

ABSTRACT

This annual report provides province-wide results for the entire school year (January, June, and August examinations combined) The graphs, tables, and text describe student performance for the entire school year to assist school personnel in identifying patterns of student achievement and evaluating program effectiveness. The diploma examinations are designed to certify the level of individual student achievement, ensure that province-wide standards of achievement are maintained, and to report individual and group results. In the 1995-96 school year, in all courses except Mathematics 30 and Mathematics 33, more than 90% of students achieved the province's acceptable standard. A high percentage of students also achieved the standard of excellence in the sciences. Although 51% of the system's grade 12 students were male, fewer males than females wrote the diploma examinations in most courses. The reason for this lower participation by males cannot be determined from available data, but individual districts may wish to study this and other examination results in local contexts. Results are presented for regular student and mature student population subgroups. Mature students do not have current school-awarded marks but have earlier marks. Appendixes discuss the test development process, guidelines for interpreting and using the examination results, and the percentage distribution of marks in diploma examination courses. (Contains 38 figures and 42 tables.) (SLD)

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1995–96 School Year

Annual Report

Diploma Examinations Program

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1995–96 School Year

Annual Report

Diploma Examinations Program

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Alberta Education Cataloguing in Publication Data

ISSN 1185-2364

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Students	
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Administrators	✓
Parents	
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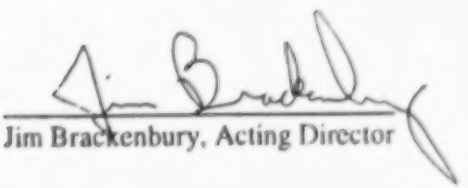
Message from the Director

Many teachers worked with Alberta Education during the 1995–96 school year, assisting with various aspects of the Diploma Examinations Program. Teachers helped with the development of exam questions, as well as field testing, marking, and the administration of the diploma exams. Superintendents, high school principals, and others in our school systems also helped make the examinations program work. We appreciate this assistance and the commitment of school districts to a high quality examinations program.

This annual report combines the January, June, and August provincial results in diploma exam courses. The graphs, tables, and text describe student performance for the entire school year. This report is designed to assist school personnel in identifying patterns of students' achievement in the province and monitoring the effectiveness of their programs in supporting student learning.

The *Annual Report* is also available on Alberta Education's Home Page (http://ednet.edc.gov.ab.ca). This supports our goal of providing information to Albertans about student achievement in this province. I hope that many Albertans will look at this report and find it of interest and value.



Jim Brackenbury, Acting Director

Section 1

Grade 12 Diploma Examinations Program

Diploma examinations are administered in January, June, and August of each school year.

The Grade 12 Diploma Examinations Program, established in 1984, has three main purposes:

- to **certify** the level of individual student achievement in selected Grade 12 courses
- to **ensure** that province-wide **standards** of achievement are maintained
- to **report** individual and group results

The examination development process, described in Appendix A, ensures that this form of assessment provides valid and reliable results. Eleven Grade 12 courses have diploma examinations, and seven of these* are available in French translation:

- English 30
- English 33
- Social Studies 30*
- Social Studies 33*
- Français 30
- Mathematics 30*
- Mathematics 33*
- Biology 30*
- Chemistry 30*
- Physics 30*
- Science 30

This *Diploma Examinations Program Annual Report* provides province-wide results for the entire school year, that is, for the January, June, and August examinations combined. Additionally, the annual report provides summaries of results by gender, for population subgroups, and for achievement-over-time studies.

Occasional research findings on issues of topical interest related to the program are also featured. In the 1995–96 report, a study of differential item functioning between males and females on the June 1996 administration of Social Studies 30 is presented.

Certification

A student's final mark in a diploma examination course is a fifty-fifty "blend" of the examination mark and the school-awarded mark (except for students with mature status; see Section 4). For example, a diploma examination mark of 57% combined with a school-awarded mark of 45% would produce a **final course mark of 51%**, a "pass" in the course. This student would earn high school graduation credits for the course. The "blending" of the two marks to produce a final course mark recognizes the fact that the diploma examination assesses only those learning outcomes, listed in the *Program of Studies*, that can be effectively measured in a limited time using paper-and-pencil tests. The school can best assess students' achievement in the laboratory, in research, in oral communication, and in cooperative learning.

Standards

The *Program of Studies* for each diploma examination course outlines what students are expected to know and to be able to do in order to pass the course. Information bulletins published at the beginning of the school year provide details about "how well" students are expected to do; that is, the bulletins outline the assessment standards for each diploma examination course. Students who achieve the *acceptable standard* of performance receive a final course mark of 50% or higher. Students who achieve the *standard of excellence* receive a final course mark of 80% or higher.

Reporting

The results achieved by students in the Diploma Examinations Program are aggregated at the school, jurisdiction, and provincial levels and are presented in this and the three reports described below. The purpose of the Diploma Examinations Program is to help school administrators, teachers, trustees, and Alberta Education evaluate the effectiveness of educational programs. Guidelines for interpreting and using these reports are given in Appendix B.

These reports should not be used as the basis for evaluating teacher performance or for comparing performance between schools or jurisdictions.

Percentage Distribution of Marks in Diploma Examination Courses is a three-page report distributed to educators in schools, jurisdictions, and other educational institutions approximately three weeks after the January and June examinations are written. The report is also available to the public on request. The reports issued in 1996 are reproduced in Appendix C.

School and Jurisdiction Reports for each diploma examination course are distributed to superintendents and principals soon after the January and June administrations. These reports provide results at the question and sub-test level for each school and jurisdiction. This information is particularly useful in assessing the strengths and weaknesses of local programs. These reports are available to the public through the superintendent or principal, according to local board policy. Summary reports are also available on CD-ROM from the Learning Resources Distribution Centre.

Examiners' Reports for each course, which are distributed after the January and June writings, are intended primarily for teachers. Provincial results are provided in relation to course standards as reflected in the examination blueprints and information bulletins. The January and June 1996 *Examiners' Reports* are available on request.

Section 2

Summary of Results

This section provides the overall results and describes certain broad characteristics of the students who wrote the diploma examinations.

The following questions will be answered:

- What percentage of students achieved the *acceptable standard* or the *standard of excellence* according to criteria set by Alberta Education?
- How many students wrote each diploma examination and how do these numbers compare with the previous two years?
- What was the average number of different diploma examinations written by each student in each course during the 1995–96 school year?
- What was the distribution of A, B, C, and F for each diploma examination course and how does this distribution compare with distributions of previous years?
- For each diploma examination course, what is the correlation between examination marks and school-awarded marks?

What percentage of students achieved the *acceptable standard* or the *standard of excellence* according to criteria set by Alberta Education?

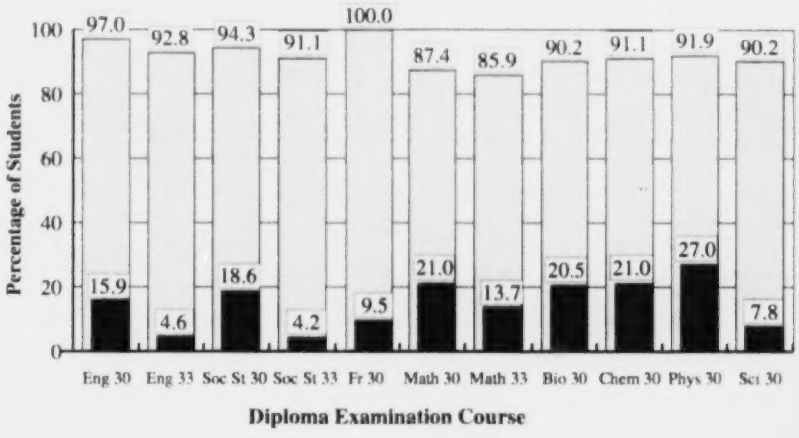
Figure 2-1 shows the percentage of students achieving the *acceptable standard* and the *standard of excellence* based on the final course mark. The "final course mark" is the average of the school-awarded mark and the diploma examination mark or as otherwise provided by Alberta Education policy.

During the 1995–96 school year, final course marks showed that in all courses, except Mathematics 30 and Mathematics 33, more than 90% of students achieved the *acceptable standard*. A high percentage of students also achieved the *standard of excellence* in the sciences.

In Alberta, courses are selected by students according to their own needs, aspirations, and expectations. This may account for much of the differential achievement among courses. For this reason, local targets for the percentage of students expected to achieve the *acceptable standard* or the *standard of excellence* are best set in the context of local policies and conditions.

Figure 2-1

Percentage of Students Achieving Standards (Final Course Mark)
1995–96 School Year



Students achieving the *acceptable standard* (final course mark of 50% to 100%)

Students achieving the *standard of excellence* (final course mark of 80% to 100%)

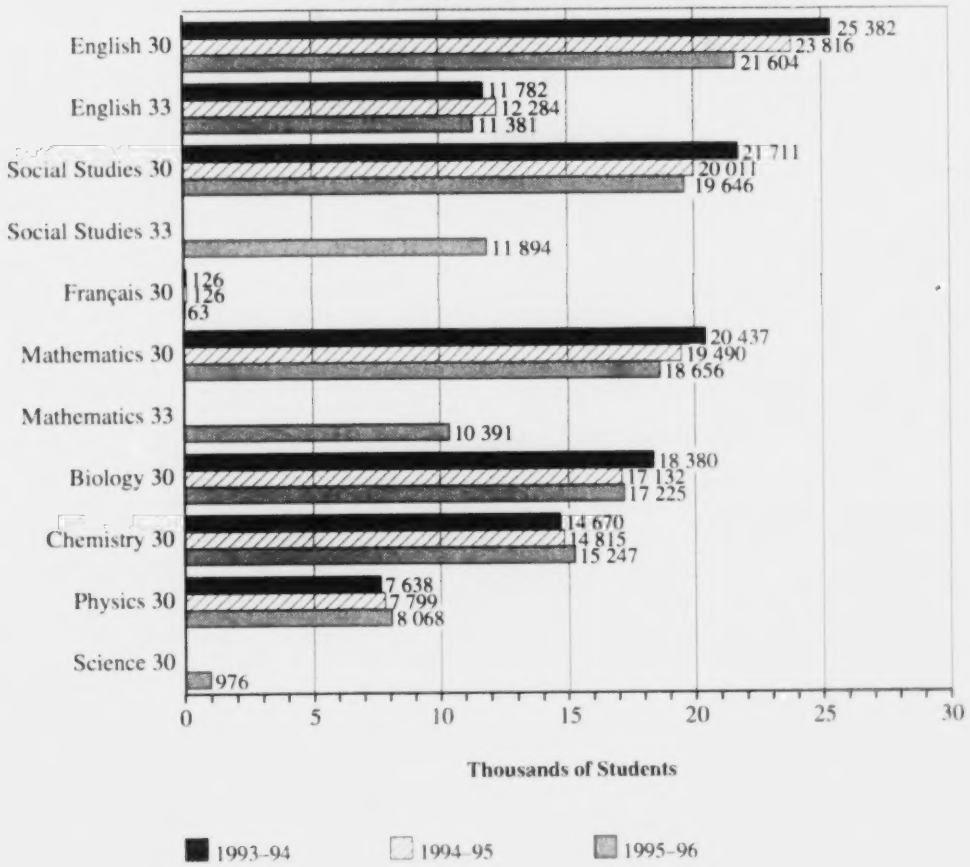
How many students wrote each diploma examination and how do these numbers compare with the previous two years?

As shown in Figure 2-2, the number of students writing diploma examinations declined in 1995–96 for most courses, compared with the previous two years. However, the opposite trend occurred in Chemistry 30 and Physics 30 as enrollment increased during the last three years.

Note: All students who wrote more than one diploma examination in a course during a single year are counted only once. Students who wrote examinations in the same course in different years are counted once in each year they wrote. Students from the Northwest Territories are not included in these counts. Because Figure 2-2 includes students who were not given a school mark, the numbers are slightly higher than in the figures on pages 4 to 8.

Figure 2-2

Number of Students Writing Diploma Examinations in Each Course 1993–94, 1994–95, and 1995–96 School Years



What was the average number of different diploma examinations written by each student in each course during the 1995–96 school year?

As shown in Figure 2-3, the average number of different diploma examinations written by students ranged from a low of 2.46 for students writing the English 33 examination to a high of 5.33 for students writing the Français 30 examination.

What was the distribution of A, B, C, and F for each diploma examination course and how does this distribution compare with distributions of previous years?

The distribution of A, B, C, and F for each course is shown in figures 2-4 to 2-25.

There are two graphs for each course. The first shows the distribution for final course marks over the last three years.

The distributions remained relatively unchanged over time for all courses.

The second of the two graphs shows the 1995–96 school year distribution of A, B, C, and F for the school-awarded mark, the diploma examination mark, and the final course mark.

The number of Fs awarded to students for a final course mark is much lower than the number of Fs awarded for either the school-awarded mark or the diploma examination mark. One reason for this is that no final marks of 48% or 49% are awarded. If the average of the school-awarded mark and the diploma examination mark is 48% or 49%, the student is automatically given 50% as a final mark.

Note: Diploma examinations were administered for the first time in the 1995-96 school year for Social Studies 33, Mathematics 33, and Science 30. Consequently, only the 1995-96 results are reported for these three subjects.

Figure 2-3

Average Number of Different Diploma Examinations Written by Students in Each Course 1995–96 School Year

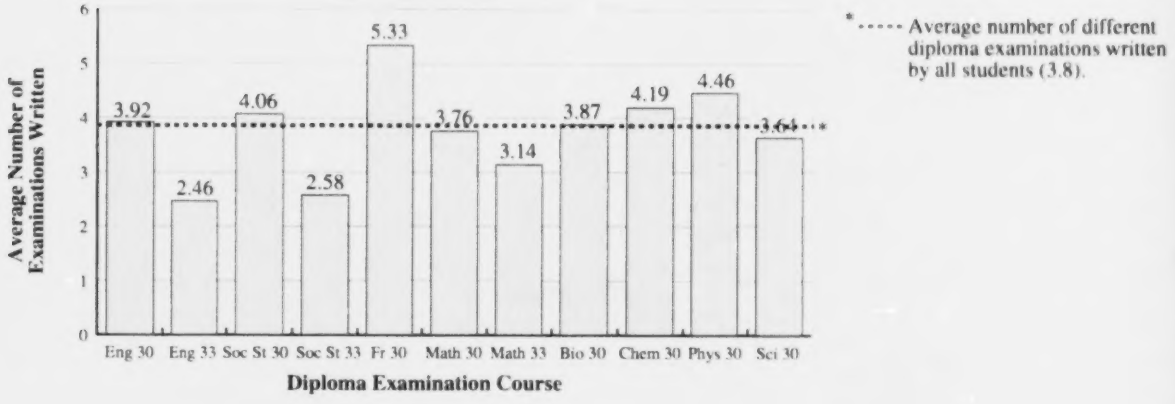


Figure 2-4

English 30
Distribution of A, B, C, and F for Final Course Mark Three School Years

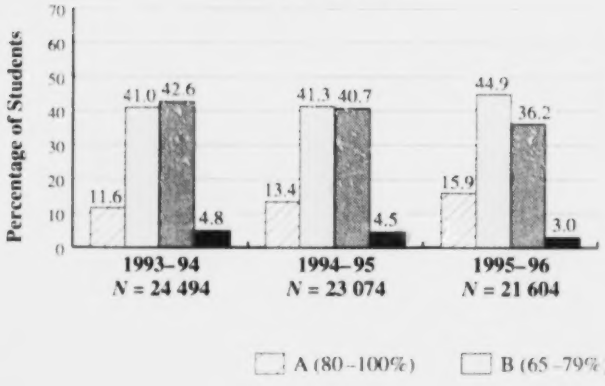


Figure 2-5

English 30
Distribution of A, B, C, and F for School, Examination, and Final Course Marks 1995–96 School Year

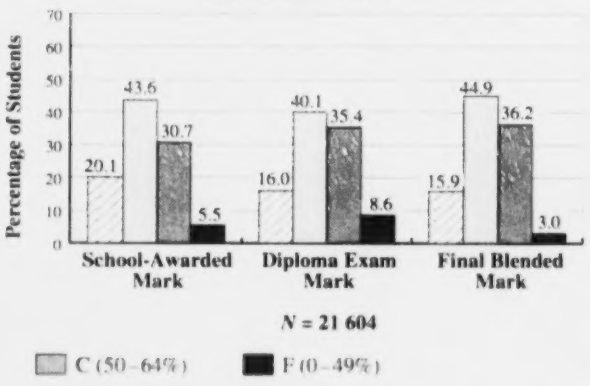


Figure 2-6

English 33
Distribution of A, B, C, and F for Final Course Mark Three School Years

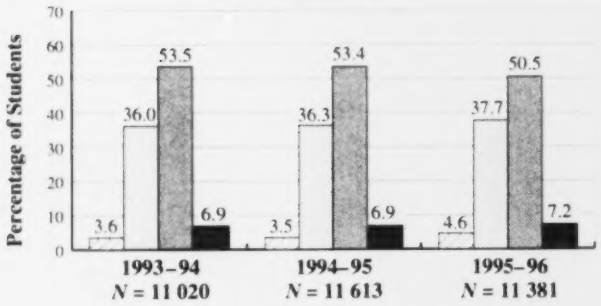


Figure 2-7

English 33
Distribution of A, B, C, and F for School, Examination, and Final Course Marks 1995–96 School Year

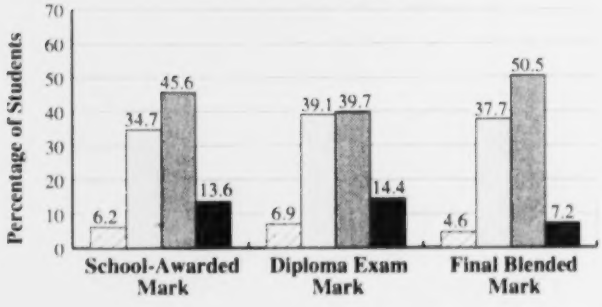


Figure 2-8

Social Studies 30
Distribution of A, B, C, and F for Final Course Mark Three School Years

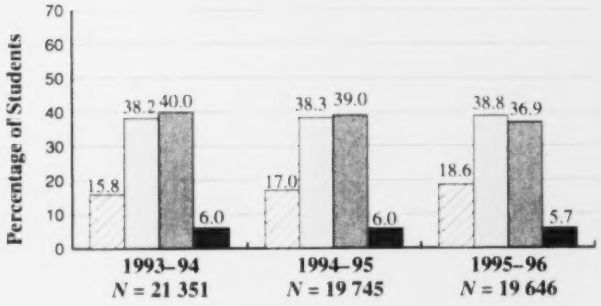


Figure 2-9

Social Studies 30
Distribution of A, B, C, and F for School, Examination, and Final Course Marks 1995–96 School Year

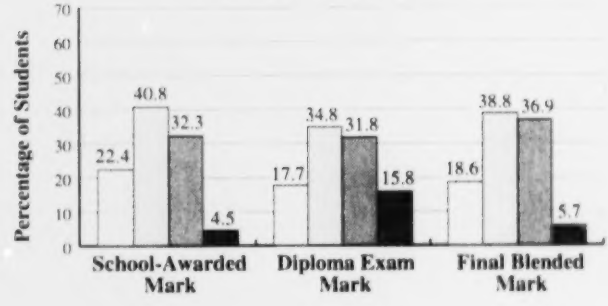


Figure 2-10

Social Studies 33
Distribution of A, B, C, and F for Final Course Mark Three School Years

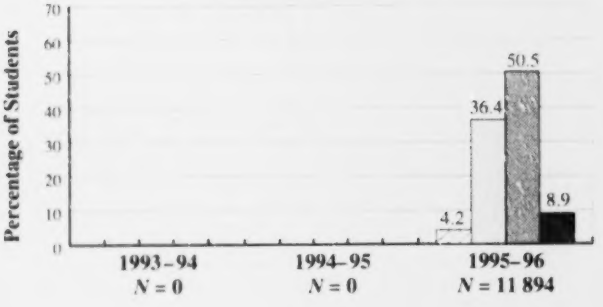
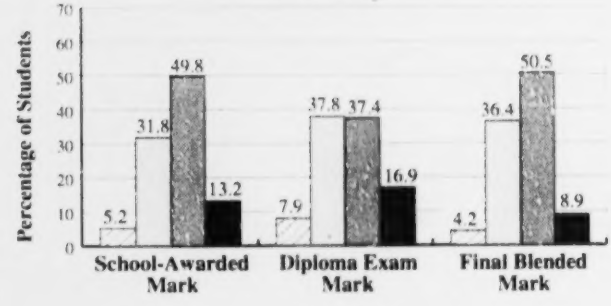


Figure 2-11

Social Studies 33
Distribution of A, B, C, and F for School, Examination, and Final Course Marks 1995–96 School Year



A (80–100%) B (65–79%) C (50–64%) F (0–49%)

Figure 2-12

Français 30
Distribution of A, B, C, and F for Final Course Mark Three School Years

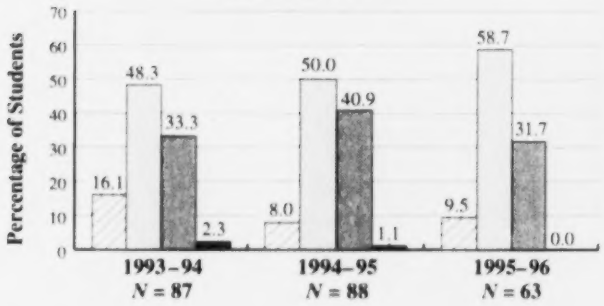


Figure 2-13

Français 30
Distribution of A, B, C, and F for School, Examination, and Final Course Marks 1995–96 School Year

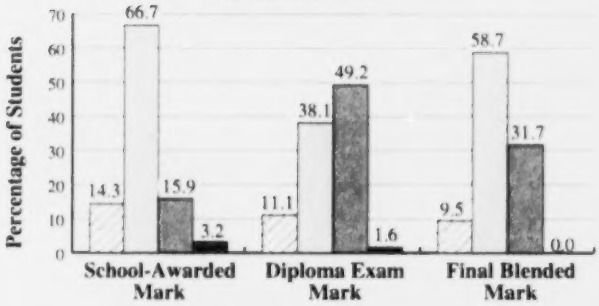


Figure 2-14

Mathematics 30
Distribution of A, B, C, and F for Final Course Mark Three School Years

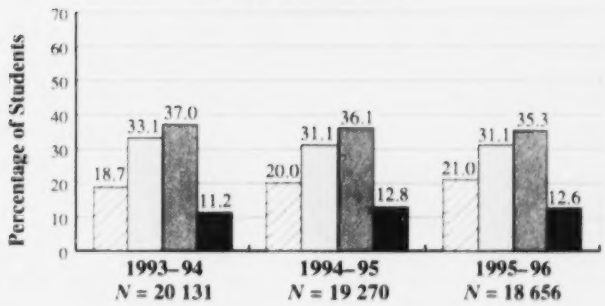


Figure 2-15

Mathematics 30
Distribution of A, B, C, and F for School, Examination, and Final Course Marks 1995–96 School Year

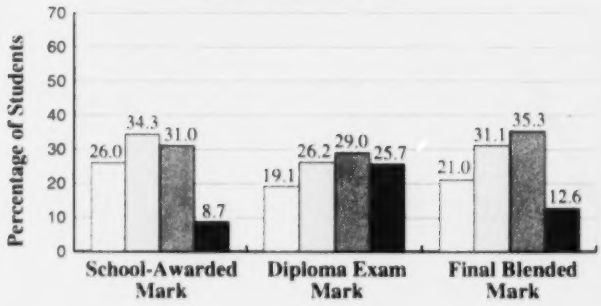


Figure 2-16

Mathematics 33
Distribution of A, B, C, and F for Final Course Mark Three School Years

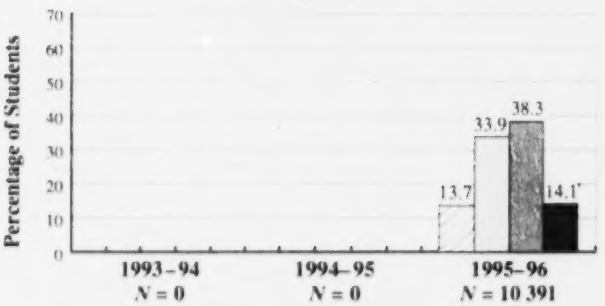
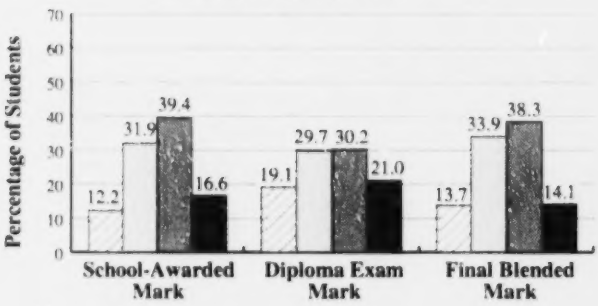


Figure 2-17

Mathematics 33
Distribution of A, B, C, and F for School, Examination, and Final Course Marks 1995–96 School Year



A (80–100%) B (65–79%) C (50–64%) F (0–49%)

Figure 2-18

Biology 30
Distribution of A, B, C, and F for Final Course Mark
Three School Years

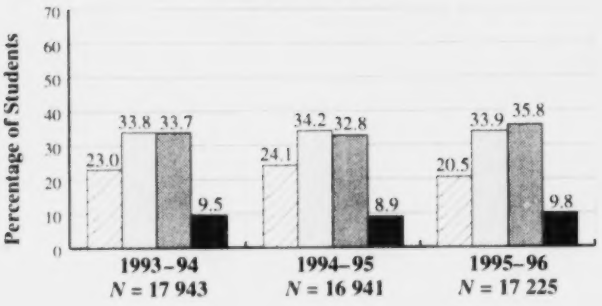


Figure 2-19

Biology 30
Distribution of A, B, C, and F for School, Examination, and Final Course Marks
1995–96 School Year

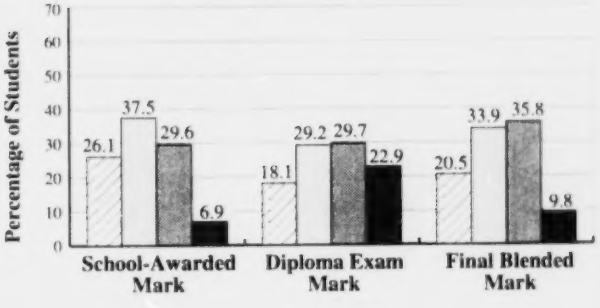


Figure 2-20

Chemistry 30
Distribution of A, B, C, and F for Final Course Mark
Three School Years

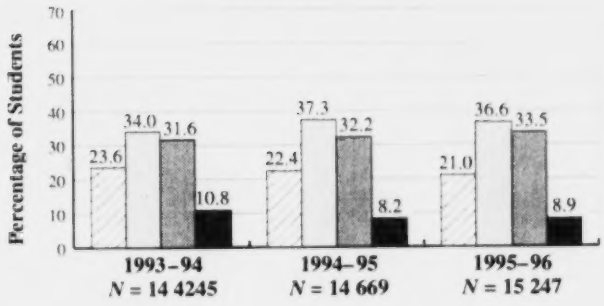


Figure 2-21

Chemistry 30
Distribution of A, B, C, and F for School, Examination, and Final Course Marks
1995–96 School Year

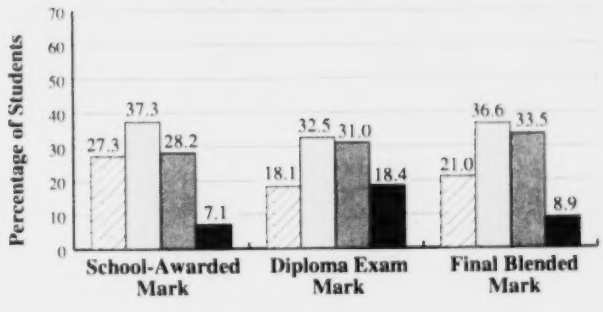


Figure 2-22

Physics 30
Distribution of A, B, C, and F for Final Course Mark
Three School Years

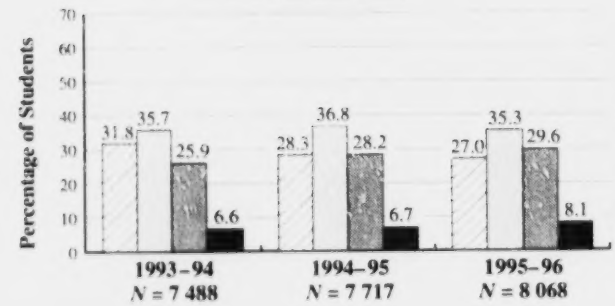
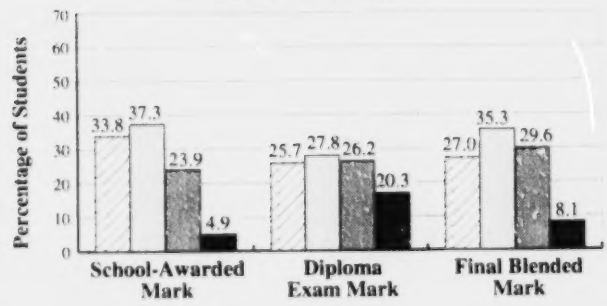


Figure 2-23

Physics 30
Distribution of A, B, C, and F for School, Examination, and Final Course Marks
1995–96 School Year



A (80–100%) B (65–79%) C (50–64%) F (0–49%)

Figure 2-24

Science 30
Distribution of A, B, C, and F for Final Course Mark Three School Years

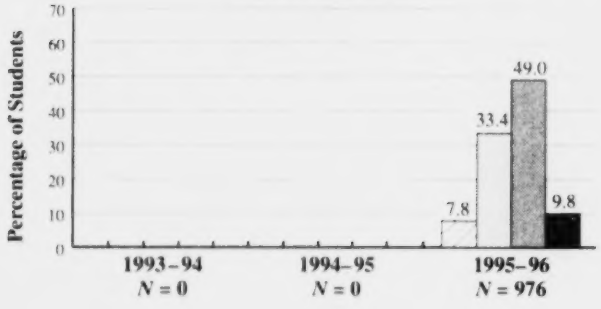
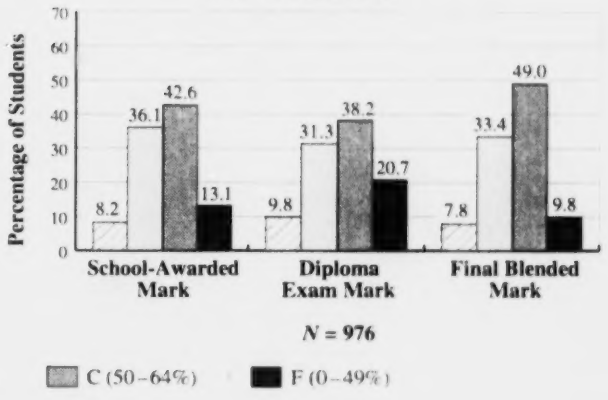


Figure 2-25

Science 30
Distribution of A, B, C, and F for School, Examination, and Final Course Marks 1995–96 School Year



For each diploma examination course, what is the correlation between examination marks and school-awarded marks?

Table 2-1 presents the correlation between diploma examination marks and school-awarded marks for each diploma examination course.

The two marks represent two separate assessments of achievement, each based on an overlapping yet different set of curricular objectives. To a large degree, these objectives are similar; however, there is a necessary degree of difference.

The diploma examinations are limited to measuring achievement of objectives that can be effectively assessed by paper-and-pencil tests. School assessments also measure achievement of additional objectives such as laboratory skills in the sciences, or speaking and listening skills in English. Therefore, these correlations are expected to be positive and relatively high, but less than 1.0.

Other factors that contribute to the less-than-perfect correlations include variations among teachers' assessment practices, the longer time span of school-based assessment, the effect of failure to complete assignments, and the individual student's approach to the different types of assessment.

Table 2-1

Correlation of Diploma Examination Marks and School-Awarded Marks by Course 1995–96 School Year

Course	Number of Students	Correlation Coefficient
English 30	21 604	0.627
English 33	11 381	0.415
Social Studies 30	19 646	0.759
Social Studies 33	11 894	0.493
Français 30	63	0.617
Mathematics 30	18 656	0.797
Mathematics 33	10 391	0.664
Biology 30	17 225	0.794
Chemistry 30	15 247	0.786
Physics 30	8 068	0.762
Science 30	976	0.570

Section 3

Results by Gender

This section of the report provides separate results for males and females. The following questions will be answered:

- What proportion of males and females write diploma examinations?
- Is the percentage of males and females who achieve the standards the same in each course?
- Are males and females awarded similar school marks? Is the pattern the same for diploma examination marks?

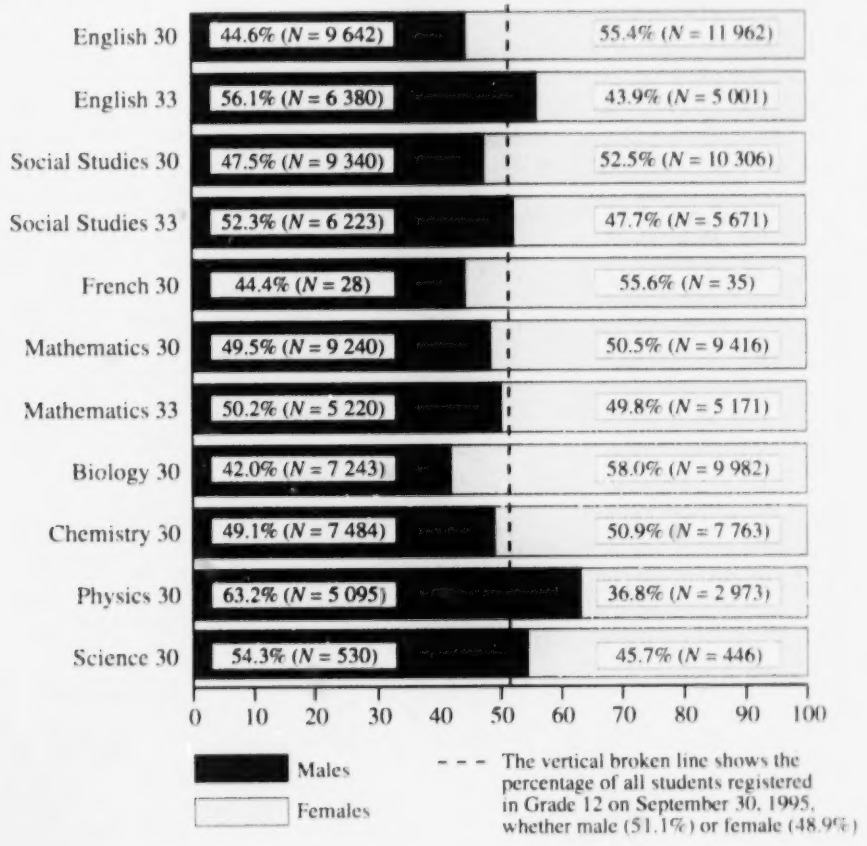
What proportion of males and females write diploma examinations?

Of all students registered in Grade 12 on September 30, 1995, 51% were male. Figure 3-1 shows that in the 1995–96 school year, fewer males than females wrote diploma examinations in all courses except English 33, Social Studies 33, Mathematics 33, Physics 30, and Science 30. The reasons for this underrepresentation of males among students writing most diploma examinations cannot be determined from the available data. Schools and jurisdictions that wish to explore this relationship further could look at:

- the percentage of males and females seeking a high school diploma
- the percentage of males and females returning to school for a fourth year of high school and the courses in which they choose to enroll
- the percentage of males and females who register in a course but drop the course before writing a diploma examination

Figure 3-1

Ratio of Males to Females Writing Diploma Examinations 1995–96 School Year


English 30
44.6% (N = 9 642)
55.4% (N = 11 962)
English 33
56.1% (N = 6 380)
43.9% (N = 5 001)
Social Studies 30
47.5% (N = 9 340)
52.5% (N = 10 306)
Social Studies 33
52.3% (N = 6 223)
47.7% (N = 5 671)
French 30
44.4% (N = 28)
55.6% (N = 35)
Mathematics 30
49.5% (N = 9 240)
50.5% (N = 9 416)
Mathematics 33
50.2% (N = 5 220)
49.8% (N = 5 171)
Biology 30
42.0% (N = 7 243)
58.0% (N = 9 982)
Chemistry 30
49.1% (N = 7 484)
50.9% (N = 7 763)
Physics 30
63.2% (N = 5 095)
36.8% (N = 2 973)
Science 30
54.3% (N = 530)
45.7% (N = 446)
0 10 20 30 40 50 60 70 80 90 100
Males
Females
The vertical broken line shows the percentage of all students registered in Grade 12 on September 30, 1995, whether male (51.1%) or female (48.9%)

Is the percentage of males and females who achieve the standards the same in each course?

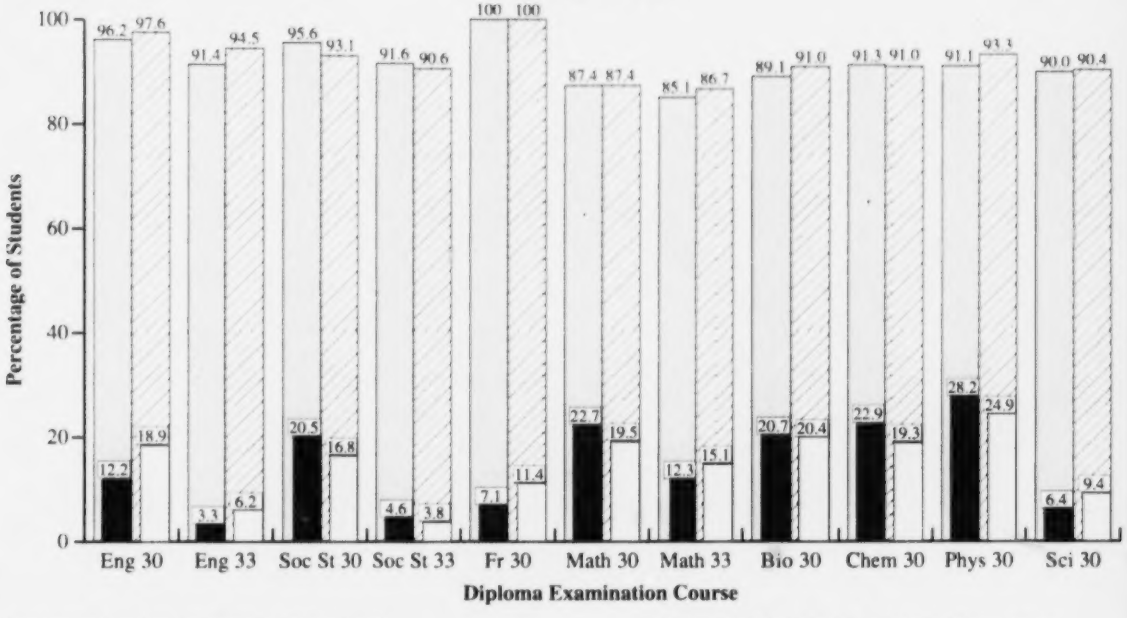
Figure 3-2 shows that a higher percentage of males than females achieved the *standard of excellence* in their final course marks for Social Studies 30, Social Studies 33, Mathematics 30, Biology 30, Chemistry 30, and Physics 30.

A higher percentage of females than males achieved the *standard of excellence* in their final course marks in English 30, English 33, Français 30, Mathematics 33, and Science 30. The percentage of females who achieved the *acceptable standard* exceeded the percentage of males in all courses except for Social Studies 30, Social Studies 33, and Chemistry 30. There was no difference between the proportions in Français 30 and Mathematics 30.

Table 3-1 shows the actual number of male and female students who achieved standards in each course.

Figure 3-2

Percentage of Students Achieving Standards, by Gender (Final Course Mark) 1995–96 School Year



Students achieving the *acceptable standard* (final course mark of 50% to 100%).

Male Female

Students achieving the *standard of excellence* (final course mark of 80% to 100%).

Male Female

Table 3-1

Number of Students Achieving Standards, by Gender (Final Course Mark) 1995–96 School Year

Course	Students Achieving the Acceptable Standard			Students Achieving the Standard of Excellence		
	Male	Female	Total	Male	Female	Total
English 30	9 272	11 674	20 946	1 174	2 255	3 429
English 33	5 829	4 727	10 556	208	310	518
Social Studies 30	8 930	9 591	18 521	1 916	1 729	3 645
Social Studies 33	5 702	5 138	10 840	286	214	500
Français 30	28	35	63	2	4	6
Mathematics 30	8 074	8 230	16 304	2 093	1 832	3 925
Mathematics 33	4 444	4 482	8 926	644	779	1 423
Biology 30	6 451	9 081	15 532	1 499	2 032	3 531
Chemistry 30	6 830	7 066	13 896	1 712	1 496	3 208
Physics 30	4 639	2 773	7 412	1 435	741	2 176
Science 30	477	403	880	34	42	76

Are males and females awarded similar school marks? Is the pattern the same for diploma examination marks?

Table 3-2 shows the results of a comparison between the school-awarded marks and diploma examination marks for males and females. When averages in school-awarded marks are compared, females are seen to achieve higher averages than males in all courses except Social Studies 30. In all subjects, the percentage of females achieving an F was smaller than the percentage of males. A greater percentage of females than males achieved an A in all subjects except Social Studies 30, Mathematics 30, and Chemistry 30.

With the diploma examination marks, females achieved higher averages than males in English 30, English 33, and Mathematics 33. Males achieved higher diploma examination marks in all other courses. The percentage of females achieving an F was greater than the percentage of males achieving an F in all subjects except English 30, and English 33. A smaller percentage of females than males achieved an A on all diploma examinations except for English 30, English 33, and Mathematics 33.

For the final course marks, females achieved higher averages than males in English 30, English 33, Français 30, Mathematics 33, Biology 30, and Science 30. The percentage of females achieving an F was greater than the percentage of males in Social Studies 30, Social Studies 33, and Chemistry 30. The percentage of females achieving an A for the final course mark was greater than the percentage of males in English 30, English 33, Français 30, Mathematics 33, and Science 30.

Table 3-2

Provincial Percentage Distribution of A, B, C, and F, Average, and Standard Deviation* of Scores
1995–96 School Year

Course	School-Awarded Mark			Diploma Exam Mark			Final Course Mark		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
English 30									
A (80–100%)	20.1	14.8	24.4	16.0	13.6	17.9	15.9	12.2	18.9
B (65–79%)	43.6	42.2	44.8	40.1	39.7	40.4	44.9	43.3	46.2
C (50–64%)	30.7	35.8	26.6	35.4	37.1	34.0	36.2	40.7	32.5
F (0–49%)	5.5	7.3	4.1	8.6	9.5	7.8	3.0	3.8	2.4
Average (%)	68.1	66.0	69.9	66.5	65.5	67.3	67.8	66.3	69.0
Standard Deviation (%)	12.3	12.3	12.0	12.7	12.5	12.7	11.2	11.0	11.1
English 33									
A (80–100%)	6.2	4.0	9.0	6.9	6.1	7.9	4.6	3.3	6.2
B (65–79%)	34.7	29.1	41.7	39.1	38.6	39.7	37.7	33.9	42.5
C (50–64%)	45.6	49.7	40.3	39.7	40.0	39.3	50.5	54.2	45.8
F (0–49%)	13.6	17.2	8.9	14.4	15.3	13.2	7.2	8.6	5.5
Average (%)	61.0	58.9	63.7	62.7	62.2	63.3	62.4	61.1	64.1
Standard Deviation (%)	12.1	11.9	11.8	12.0	12.0	12.0	10.3	10.1	10.2
Social Studies 30									
A (80–100%)	22.4	22.5	22.3	17.7	20.5	15.1	18.6	20.5	16.8
B (65–79%)	40.8	40.9	40.7	34.8	38.0	31.9	38.8	40.7	37.1
C (50–64%)	32.3	32.0	32.6	31.8	29.8	33.6	36.9	34.4	39.2
F (0–49%)	4.5	4.6	4.4	15.8	11.7	19.5	5.7	4.4	6.9
Average (%)	68.8	68.8	68.7	65.0	67.1	63.1	67.2	68.3	66.2
Standard Deviation (%)	12.2	12.3	12.2	14.6	14.0	14.9	12.6	12.3	12.7
Social Studies 33									
A (80–100%)	5.2	4.7	5.8	7.9	9.6	6.0	4.2	4.6	3.8
B (65–79%)	31.8	29.7	34.1	37.8	42.2	32.8	36.4	38.2	34.5
C (50–64%)	49.8	50.6	49.0	37.4	34.6	40.6	50.5	48.8	52.4
F (0–49%)	13.2	15.0	11.1	16.9	13.6	20.5	8.9	8.4	9.4
Average (%)	60.5	59.8	61.4	62.1	63.9	60.2	61.8	62.3	61.2
Standard Deviation (%)	11.4	11.5	11.2	12.9	12.7	12.8	10.6	10.6	10.5

(continued)

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Table 3-2 (*continued*)

Course	School-Awarded Mark			Diploma Exam Mark			Final Course Mark		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Français 30**									
A (80–100%)	14.3	7.1	20.0	11.1	14.3	8.6	9.5	7.1	11.4
B (65–79%)	66.7	75.0	60.0	38.1	28.6	45.7	58.7	57.1	60.0
C (50–64%)	15.9	14.3	17.1	49.2	57.1	42.9	31.7	35.7	28.6
F (0–49%)	3.2	3.6	2.9	1.6	0.0	2.9	0.0	0.0	0.0
Average (%)	71.5	70.0	72.7	66.1	66.4	66.0	69.0	68.4	69.6
Standard Deviation (%)	9.5	8.6	10.1	9.9	9.9	10.0	8.7	8.2	9.1
Mathematics 30									
A (80–100%)	26.0	26.4	25.5	19.1	21.2	17.0	21.0	22.7	19.5
B (65–79%)	34.3	33.5	35.1	26.2	26.3	26.1	31.1	30.8	31.3
C (50–64%)	31.0	30.8	31.3	29.0	28.1	29.8	35.3	33.9	36.6
F (0–49%)	8.7	9.3	8.1	25.7	24.4	27.1	12.6	12.6	12.6
Average (%)	68.4	68.4	68.5	61.9	62.9	60.9	65.5	66.0	65.0
Standard Deviation (%)	14.5	14.8	14.1	18.2	18.6	17.8	15.5	15.9	15.1
Mathematics 33									
A (80–100%)	12.2	9.9	14.5	19.1	18.2	19.9	13.7	12.3	15.1
B (65–79%)	31.9	29.8	33.9	29.7	29.8	29.6	33.9	33.0	34.9
C (50–64%)	39.4	41.4	37.3	30.2	31.3	29.1	38.3	39.8	36.7
F (0–49%)	16.6	18.8	14.3	21.0	20.7	21.4	14.1	14.9	13.3
Average (%)	62.0	60.6	63.5	63.4	63.1	63.7	63.3	62.5	64.2
Standard Deviation (%)	14.1	13.9	14.0	16.5	16.5	16.5	14.1	14.0	14.1
Biology 30									
A (80–100%)	26.1	24.5	27.3	18.1	19.2	17.4	20.5	20.7	20.4
B (65–79%)	37.5	35.5	38.9	29.2	27.8	30.2	33.9	31.9	35.3
C (50–64%)	29.6	31.4	28.2	29.7	30.3	29.3	35.8	36.5	35.3
F (0–49%)	6.9	8.5	5.7	22.9	22.7	23.1	9.8	10.9	9.0
Average (%)	69.1	68.1	69.8	62.9	63.0	62.8	66.3	65.9	66.6
Standard Deviation (%)	13.5	13.9	13.1	16.5	16.8	16.3	14.2	14.6	13.9
Chemistry 30									
A (80–100%)	27.3	27.5	27.2	18.1	20.3	16.0	21.0	22.9	19.3
B (65–79%)	37.3	35.8	38.8	32.5	33.6	31.5	36.6	36.5	36.8
C (50–64%)	28.2	28.8	27.7	31.0	29.7	32.2	33.5	31.9	34.9
F (0–49%)	7.1	8.0	6.4	18.4	16.4	20.4	8.9	8.7	9.0
Average (%)	69.4	69.2	69.7	64.2	65.4	63.0	67.2	67.7	66.6
Standard Deviation (%)	13.9	14.3	13.5	15.8	16.0	15.6	14.0	14.3	13.8
Physics 30									
A (80–100%)	33.8	32.7	35.9	25.7	27.9	21.9	27.0	28.2	24.9
B (65–79%)	37.3	36.7	38.4	27.8	27.4	28.4	35.3	33.9	37.7
C (50–64%)	23.9	24.7	22.6	26.2	24.6	29.1	29.6	28.9	30.7
F (0–49%)	4.9	5.9	3.2	20.3	20.1	20.7	8.1	8.9	6.7
Average (%)	71.9	71.3	72.9	65.4	66.1	64.2	69.0	69.1	68.8
Standard Deviation (%)	13.5	13.9	12.7	17.9	18.3	17.1	14.7	15.2	14.0

(continued)

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Table 3-2 (*continued*)

Course	School-Awarded Mark			Diploma Exam Mark			Final Course Mark		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Science 30									
A (80–100%)	8.2	4.9	12.1	9.8	10.2	9.4	7.8	6.4	9.4
B (65–79%)	36.1	32.8	39.9	31.3	32.6	29.6	33.4	31.5	35.7
C (50–64%)	42.6	46.4	38.1	38.2	39.2	37.0	49.0	52.1	45.3
F (0–49%)	13.1	15.8	9.9	20.7	17.9	24.0	9.8	10.0	9.6
Average (%)	62.5	60.4	64.9	61.2	62.1	60.1	62.2	61.7	62.8
Standard Deviation (%)	12.4	12.5	11.9	13.9	13.6	14.3	11.7	11.5	11.8

*Standard deviation is an indication of the amount of variation in a distribution. About 68% of the students' marks will fall within plus or minus one "standard deviation" of the average mark. On the English 30 Diploma Examination, for example, 68% of students who wrote the examination scored between 55.8 and 80.4%.

**Because very few students wrote the Français 30 examinations, results must be interpreted with caution.

Summary

There are gender differences in the marks obtained for the diploma examination courses. A larger proportion of females than males are writing the diploma examinations. Although the achievement of females is similar to or higher than the achievement of males in school-awarded marks, their achievement on many of the diploma examinations is below the achievement of males.

Since individual jurisdiction results will show patterns that differ from the province-wide results, school boards are encouraged to explore gender differences in their own jurisdictions.

The data presented in this section show gender differences to a greater or lesser degree in all diploma examination courses. Schools should consider these results carefully within their own contexts.

We welcome any comments regarding observations or thoughts you have on gender differences in achievement. If you would like to share your thoughts with us, please contact Elana Scraba, Assistant Director, Humanities Diploma Examinations Program, at 403-427-0010, toll-free at 310-0000, or write to her at Student Evaluation Branch, Alberta Education, 11160 Jasper Avenue, Edmonton, Alberta T5K 0L2.

Section 4

Results for Population Subgroups

The majority of students who wrote a 1995–96 diploma examination took the course in school as regular students; the second largest group were mature students* with current school-awarded marks. Results for students with both school-awarded marks and diploma examination marks are reported in sections 2 and 3 of this report.

This section reports the results for all students, *including those with no school-awarded marks*. Subgroup definitions and results are reported.

This section will answer these questions:

- Does the percentage of mature students writing diploma examinations vary across courses?
- How does the performance of mature students with current school-awarded marks compare with the performance of regular students with current school-awarded marks?
- How does the performance of students with school marks brought forward compare with the results of students with current school-awarded marks?
- How does the performance of mature students challenging the examination compare with the performance of other mature student subgroups?
- For subgroups with current school-awarded marks and diploma examination marks, how does the diploma examination mark average compare with the school-awarded mark average?

Subgroup Definitions

Subgroups are defined by a combination of mature student status and school-awarded mark status. Students in all subgroups have a current diploma examination mark. The subgroups are:

- **Regular School** Students with a current school-awarded mark. This group comprises regular students and mature students.

  Regular Students are students without mature status who have a current school-awarded mark.

  Mature Students are students with mature status who have a current school-awarded mark.

- **Regular Students, School Mark Brought Forward** Regular students who do not have a current school-awarded mark but who have an earlier school-awarded mark.

- **Mature Students, School Mark Brought Forward** Mature students who do not have a current school-awarded mark but who have an earlier school-awarded mark.

- **Mature Students, Challenging Examination** Students with mature status who have no school-awarded mark.

- **Regular Students, No School Mark** Regular students who have no school-awarded mark.

Note:

1. Mature students "challenging" a diploma examination do not take the course but do receive course credit if they pass the examination; regular students with no school-awarded mark receive no course credit.

2. When a mature student earns a diploma examination mark that is higher than that student's school-awarded mark, the diploma examination mark becomes the final course mark; otherwise, the normal blending is applied to calculate the final course mark.

Excluded Groups

Not included in any of the subgroups are students who were exempted from all or part of the examination, or who wrote a substantially different form of the examination because of special considerations. Students in English 30 or English 33 who, by special permission, wrote the two parts of the examination in two different examination sittings (e.g., January and June) are also excluded. Very few students fall into these categories.

Results for Français 30 are not included because of the small number of students writing the examination.

Results

Three tables are provided for each diploma examination course. In the first table, the number and percentage of regular and mature students writing are given. The second table gives the number of students in each subgroup, their average diploma examination mark, and standard deviations of diploma examination marks for all subgroups. The third table provides data for subgroups with school-awarded marks. It includes the number of students in each subgroup, their average school-awarded mark, and the standard deviation of school-awarded marks for these subgroups.

* A student with mature status is one who, as of September 1 of the current school year, is 20 years of age or older *or* is 19 years of age and has been out of school for eight consecutive months since reaching the age of 18 *or* is the holder of a previously awarded Alberta high school diploma or equivalent (see the *Guide to Education, Senior High School Handbook, 1995*, pages C8-1,2).

English 30: 1995–96 School Year

Achievement in English 30 by subgroups is compared in Tables 4-1 to 4-3. About one in seven English 30 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, regular students achieved higher averages in both school-awarded marks and diploma examination marks than did mature students.

Among all subgroups, regular students with no school-awarded marks achieved the highest average in diploma examination marks, while mature students with school marks brought forward achieved the lowest average.

Table 4-1

English 30
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	18 858	84.9
Mature Students	3 355	15.1
Total	22 213	100.0

Table 4-2

English 30
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	21 130	66.6	12.6
Regular Students	**18 341**	**67.6**	**12.3**
Mature Students	**2 789**	**60.5**	**13.2**
Regular Students, School Mark Brought Forward	341	63.0	13.0
Mature Students, School Mark Brought Forward	133	54.6	13.2
Mature Students, Challenging Examination	433	60.9	15.3
Regular Students, No School Mark	176	70.4	16.0

Table 4-3

English 30
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	21 130	68.2	12.3
Regular Students	**18 341**	**69.0**	**11.9**
Mature Students	**2 789**	**63.2**	**13.3**
Regular Students, School Mark Brought Forward	341	65.3	13.1
Mature Students, School Mark Brought Forward	133	63.7	10.9

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

English 33: 1995–96 School Year

Achievement in English 33 by subgroups is compared in Tables 4-4 to 4-6. About one in five English 33 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, mature students achieved a higher average in school-awarded marks than did regular students; however, regular students achieved a higher average on the diploma examination than did mature students.

Among all subgroups, mature students challenging examinations achieved the highest average in diploma examination marks. Subgroups with school marks brought forward achieved much lower averages in diploma examination marks compared with the other subgroups.

Table 4-4

English 33
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	9 619	81.0
Mature Students	2 260	19.0
Total	11 879	100.0

Table 4-5

English 33
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	11 185	62.9	11.9
Regular Students	**9 367**	**63.1**	**11.4**
Mature Students	**1 818**	**61.4**	**14.4**
Regular Students, School Mark Brought Forward	133	55.2	12.0
Mature Students, School Mark Brought Forward	63	46.1	9.9
Mature Students, Challenging Examination	379	66.8	14.1
Regular Students, No School Mark	119	63.7	12.7

Table 4-6

English 33
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	11 185	61.2	12.1
Regular Students	**9 367**	**60.9**	**11.8**
Mature Students	**1 818**	**62.5**	**13.0**
Regular Students, School Mark Brought Forward	133	51.2	11.3
Mature Students, School Mark Brought Forward	63	56.1	10.4

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

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Social Studies 30: 1995–96 School Year

Achievement in Social Studies 30 by subgroups is compared in Tables 4-7 to 4-9. About one in twelve Social Studies 30 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, regular students achieved higher averages in both school-awarded marks and diploma examination marks compared with mature students.

Among all subgroups, regular students with current school-awarded marks achieved the highest average on the examination. Subgroups with no current school-awarded marks achieved much lower averages in diploma examination marks compared with regular school subgroups.

Table 4-7

Social Studies 30
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	18 271	91.7
Mature Students	1 650	8.3
Total	19 921	100.0

Table 4-8

Social Studies 30
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	19 371	65.2	14.6
Regular Students	**17 941**	**65.7**	**14.4**
Mature Students	**1 430**	**58.5**	**14.7**
Regular Students, School Mark Brought Forward	224	54.8	14.5
Mature Students, School Mark Brought Forward	51	50.7	11.9
Mature Students, Challenging Examination	169	52.8	18.0
Regular Students, No School Mark	106	56.5	15.7

Table 4-9

Social Studies 30
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	19 371	68.9	12.2
Regular Students	**17 941**	**69.3**	**12.0**
Mature Students	**1 430**	**63.9**	**12.8**
Regular Students, School Mark Brought Forward	224	60.5	13.8
Mature Students, School Mark Brought Forward	51	62.5	12.2

*For an explanation of standard deviation, see footnote to Table 3.2, page 13.

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Social Studies 33: 1995–96 School Year

Achievement in Social Studies 33 by subgroups is compared in Tables 4-10 to 4-12. About one in twelve Social Studies 33 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, regular students achieved higher averages in both school-awarded marks and diploma examination marks than did mature students, although the difference was small for school-awarded marks.

Among all subgroups, regular students with current school-awarded marks achieved the highest average on the examination. Subgroups with no current school-awarded marks achieved lower averages in diploma examination marks than did regular school subgroups.

Table 4-10

Social Studies 33
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	11 105	91.5
Mature Students	1 033	8.5
Total	12 138	100.0

Table 4-11

Social Studies 33
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	11 748	62.3	12.9
Regular Students	**10 831**	**62.5**	**12.7**
Mature Students	**917**	**59.5**	**14.9**
Regular Students, School Mark Brought Forward	139	51.6	11.2
Mature Students, School Mark Brought Forward	7	55.4	12.1
Mature Students, Challenging Examination	109	59.7	15.2
Regular Students, No School Mark	135	61.3	13.3

Table 4-12

Social Studies 33
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	11 748	60.6	11.3
Regular Students	**10 831**	**60.7**	**11.2**
Mature Students	**917**	**60.2**	**13.3**
Regular Students, School Mark Brought Forward	139	51.2	11.4
Mature Students, School Mark Brought Forward	7	62.7	13.9

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

Mathematics 30: 1995–96 School Year

Achievement in Mathematics 30 by subgroups is compared in Tables 4-13 to 4-15. About one in seven Mathematics 30 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, regular students achieved higher averages in both school-awarded marks and diploma examination marks than did mature students.

Among all subgroups, regular students with school marks brought forward achieved the highest average on the diploma examination, while mature students with school marks brought forward, mature students challenging the examination, and regular students with no school marks achieved the lowest averages.

Table 4-13

Mathematics 30
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	15 974	84.9
Mature Students	2 848	15.1
Total	18 822	100.0

Table 4-14

Mathematics 30
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	17 996	61.9	18.2
Regular Students	**15 391**	**63.0**	**18.2**
Mature Students	**2 605**	**55.7**	**17.1**
Regular Students, School Mark Brought Forward	529	64.2	17.0
Mature Students, School Mark Brought Forward	131	47.0	16.5
Mature Students, Challenging Examination	112	43.6	19.7
Regular Students, No School Mark	54	47.5	24.1

Table 4-15

Mathematics 30
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	17 996	68.4	14.5
Regular Students	**15 391**	**69.0**	**14.3**
Mature Students	**2 605**	**65.2**	**15.0**
Regular Students, School Mark Brought Forward	529	70.2	13.7
Mature Students, School Mark Brought Forward	131	61.3	16.0

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

Mathematics 33: 1995–96 School Year

Achievement in Mathematics 33 by subgroups is compared in Tables 4-16 to 4-18. About one in six Mathematics 33 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, regular students achieved similar averages on the diploma examination when compared with mature students. Mature students had higher school-awarded marks.

Among all subgroups, mature students with current school marks achieved the highest average on the diploma examination, while mature students with school marks brought forward achieved the lowest averages.

Table 4-16

Mathematics 33
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	9 015	84.5
Mature Students	1 648	15.5
Total	10 663	100.0

Table 4-17

Mathematics 33
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	10 288	63.5	16.5
Regular Students	**8 809**	**63.5**	**16.4**
Mature Students	**1 479**	**63.8**	**17.4**
Regular Students, School Mark Brought Forward	90	52.4	14.2
Mature Students, School Mark Brought Forward	13	47.5	10.1
Mature Students, Challenging Examination	156	56.2	20.2
Regular Students, No School Mark	116	62.0	14.9

Table 4-18

Mathematics 33
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	10 288	62.1	14.0
Regular Students	**8 809**	**61.8**	**13.8**
Mature Students	**1 479**	**64.2**	**15.1**
Regular Students, School Mark Brought Forward	90	50.8	13.0
Mature Students, School Mark Brought Forward	13	60.5	15.9

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

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Biology 30: 1995–96 School Year

Achievement in Biology 30 by subgroups is compared in Tables 4-19 to 4-21. About one in eight Biology 30 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, mature students achieved a lower average in both school-awarded marks and in diploma examination marks compared with regular students.

Among all subgroups, regular students with school-awarded marks achieved the highest average on the diploma examination. Mature students with school marks brought forward achieved the lowest average on the diploma examination.

Table 4-19

Biology 30
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	15 296	88.0
Mature Students	2 093	12.0
Total	17 389	100.0

Table 4-20

Biology 30
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	16 902	63.0	16.5
Regular Students	**14 984**	**63.7**	**16.4**
Mature Students	**1 918**	**57.3**	**16.0**
Regular Students, School Mark Brought Forward	253	59.7	16.7
Mature Students, School Mark Brought Forward	70	46.9	16.3
Mature Students, Challenging Examination	105	51.4	18.7
Regular Students, No School Mark	59	51.5	15.9

Table 4-21

Biology 30
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	16 902	69.2	13.5
Regular Students	**14 984**	**69.6**	**13.3**
Mature Students	**1 918**	**65.8**	**14.3**
Regular Students, School Mark Brought Forward	253	65.6	14.4
Mature Students, School Mark Brought Forward	70	60.4	12.9

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

Chemistry 30: 1995–96 School Year

Achievement in Chemistry 30 by subgroups is compared in Tables 4-22 to 4-24. About one in eight Chemistry 30 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, regular students achieved higher averages in both school-awarded marks and diploma examination marks than did mature students.

Among all subgroups, regular students with current school-awarded marks achieved the highest average on the diploma examination. Mature students challenging the examination and regular students with no school mark achieved the lowest diploma examination scores.

Table 4-22

Chemistry 30
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	13 531	88.2
Mature Students	1 815	11.8
Total	15 346	100.0

Table 4-23

Chemistry 30
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	14 592	64.2	15.8
Regular Students	**13 272**	**64.8**	**15.8**
Mature Students	**1 680**	**59.2**	**15.2**
Regular Students, School Mark Brought Forward	236	64.4	15.1
Mature Students, School Mark Brought Forward	59	51.8	17.8
Mature Students, Challenging Examination	76	49.2	19.9
Regular Students, No School Mark	23	46.9	18.4

Table 4-24

Chemistry 30
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	14 592	69.4	13.9
Regular Students	**13 272**	**69.9**	**13.8**
Mature Students	**1 680**	**65.9**	**14.1**
Regular Students, School Mark Brought Forward	236	70.6	14.5
Mature Students, School Mark Brought Forward	59	65.9	15.5

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

Physics 30: 1995–96 School Year

Achievement in Physics 30 by subgroups is compared in Tables 4-25 to 4-27. About one in nine Physics 30 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, regular students achieved higher averages in both school-awarded marks and diploma examination marks than did mature students.

Among all subgroups, regular students with current school-awarded marks achieved the highest average on the diploma examination.

Mature students with school marks brought forward and mature students challenging the examination had the lowest diploma examination scores.

Table 4-25

Physics 30
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	7 228	88.8
Mature Students	912	11.2
Total	8 140	100.0

Table 4-26

Physics 30
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	7 943	65.5	17.9
Regular Students	**7 107**	**66.4**	**17.6**
Mature Students	**836**	**58.0**	**18.1**
Regular Students, School Mark Brought Forward	102	61.6	17.3
Mature Students, School Mark Brought Forward	23	43.1	18.6
Mature Students, Challenging Examination	53	45.0	21.9
Regular Students, No School Mark	19	62.9	21.6

Table 4-27

Physics 30
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	7 943	71.9	13.5
Regular Students	**7 107**	**72.5**	**13.1**
Mature Students	**836**	**66.5**	**15.4**
Regular Students, School Mark Brought Forward	102	70.4	14.0
Mature Students, School Mark Brought Forward	23	60.4	15.8

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

Science 30: 1995–96 School Year

Achievement in Science 30 by subgroups is compared in Tables 4-28 to 4-30. About one in 15 Science 30 students who wrote the 1995–96 diploma examinations had mature status.

Of students with current school-awarded marks, regular students achieved higher averages in both school-awarded marks and diploma examination marks than did mature students, although the differences in both cases were small.

Among all subgroups, regular students with no school-awarded marks achieved the highest average on the diploma examination. However, these results are likely to be cautiously interpreted because the size of each subgroup, except that of regular students with current school-awarded marks, is small.

Table 4-28

Science 30
Status of Students Writing

Type of Student	Number of Students	Percentage
Regular Students	921	93.4
Mature Students	65	6.6
Total	986	100.0

Table 4-29

Science 30
Diploma Examination Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	966	61.3	13.9
Regular Students	**908**	**61.4**	**13.9**
Mature Students	**58**	**59.1**	**13.0**
Regular Students, School Mark Brought Forward	9	49.4	17.4
Mature Students, School Mark Brought Forward	1	55.0	--
Mature Students, Challenging Examination	6	58.8	26.1
Regular Students, No School Mark	4	67.8	18.8

Table 4-30

Science 30
School-Awarded Marks for Population Subgroups

Subgroup	Number of Students	Average	Standard Deviation*
All Regular School	966	62.5	12.4
Regular Students	**908**	**62.6**	**12.3**
Mature Students	**58**	**61.2**	**13.4**
Regular Students, School Mark Brought Forward	9	66.3	16.6
Mature Students, School Mark Brought Forward	1	31.0	--

*For an explanation of standard deviation, see footnote to Table 3-2, page 13.

Summary

Does the percentage of mature students writing diploma examinations vary across courses?

In 1995–96, the percentage of mature students writing examinations ranged from 6.6% in Science 30 to 19.0% in English 33.

How does the performance of mature students with current school-awarded marks compare with the performance of regular students with current school-awarded marks?

In 1995–96, average marks on diploma examinations for regular students with current school-awarded marks were higher than the averages for mature students with current school-awarded marks in all courses except Mathematics 33.

How does the performance of students with school marks brought forward compare with the results of students with current school-awarded marks?

On the 1996 diploma examinations, students with school marks brought forward achieved lower averages in all courses except Mathematics 30, compared with students with current school-awarded marks.

How does the performance of mature students challenging the examination compare with the performance of other mature student subgroups?

On the 1995–96 diploma examinations, mature students challenging the diploma examination achieved the highest average in English 33 but the lowest average in Mathematics 30.

For subgroups with current school-awarded marks and diploma examination marks, how does the diploma examination mark average compare with the school-awarded mark average?

Both subgroups had higher averages in school-awarded marks than in diploma examination marks, with the exception of regular students in English 33 and Mathematics 33.

Section 5

Special Study: Differential Item Performance Between Males and Females on the June 1996 Administration of the Social Studies 30 Diploma Examination

Since 1986, when Alberta Education first began to collect and publish data comparing the performance of male and female students on diploma examinations, the Social Studies Test Development Unit noticed a consistent and worrying pattern: as a group, female students have consistently scored below their male counterparts on the multiple-choice section of the Social Studies 30 examination. In order to identify and address the underlying causes of this phenomenon, Alberta Education's Student Evaluation Branch has conducted its own internal research and has assisted several researchers who have undertaken graduate-level studies of the gender difference issue in Social Studies[1]. In addition, the examination development process employed by test development specialists within the Branch has been modified in an attempt to eliminate factors in test design that might contribute to gender differences. Yet, despite these investigations and reforms, the differences remain.

An important conceptual and methodological roadblock to the resolution of the entire gender issue is the ongoing uncertainty surrounding a basic question: What is the locus of the gender differences reflected in the aggregate averages? Three possibilities are immediately apparent. The differences may be the product of some bias inherent in the content and design of the Social Studies diploma examinations. Alternately, the examination may be reflecting real differences between the performance of males and females that are attributable to environmental factors outside the examination. (Such factors might include, but not be limited to, curricular content, student course selection, instructional climate, social milieu, or different learning styles.) Finally, the apparent differences in performance between the two groups might be the result of some combination of examination bias and environmental factors. Any serious attempt to determine the locus of gender differences requires investigators to move beyond the simple comparison of overall test averages and to employ the most current and sophisticated analytical tools that are capable of comparing the performance of males and females of similar ability on individual questions and groups of questions.

To address the persistent issues arising out of differences in overall examination performance between males and females, Alberta Education initiated a new program of research in 1996 based on recent developments in test theory. The purpose of this research is to identify multiple-choice test items that function differently for males and females on the diploma examinations, and to eliminate the items that are potentially biased. In the context of this research, the concepts of differential item functioning and item bias are distinguished as follows. Differential item functioning (DIF) refers to group differences in item performance that reflect actual knowledge and experience differences. DIF effects are constant for the members of a particular group and reflect performance differences that the test is *intended* to measure. That is, females may outperform males on some test items simply because they have a better understanding of the concepts and ideas measured by those test items. Item bias, on the other hand, refers to invalidity or systematic error in how a test item measures the performance of members of a particular group. Item bias effects are also constant for the members of a group, but reflect performance differences that are *irrelevant* or *extraneous* to the construct measured by the test.

The link between DIF and bias is largely methodological; namely, that statistical analyses are used to identify *which* items function differently for the members of a group, and content analyses are used to identify *why* items are more difficult (and therefore potentially biased) for members of a specific group. This distinction has important implications for test construction. First, it suggests a need for division of labour in the test development process, with educational measurement specialists being used to address the statistical issues, and test development specialists the content issues. The methodological distinction between DIF and bias also suggests that to effectively identify biased test items, measurement specialists and content experts must

[1]These include masters' theses by Connie Walter (*Gender Bias in Social Studies 30 Diploma Examinations 1991–1993*) and J.C. Couture (*Saturating Politics*), as well as a forthcoming doctoral dissertation by Matt Christison.

work together to evaluate the potentially flawed items. Sensitivity reviews intended to evaluate the fairness of a test cannot proceed as either a statistical exercise or as a judgemental one: both analyses are needed.

To determine the effects of differential item functioning between males and females on the June 1996 administration of Social Studies 30, statistical and judgemental analyses were undertaken. Three different statistical methods were applied to the multiple-choice items from the examination in order to identify items that functioned differently for males and females. All of these methods are relatively new and, together, reflect state-of-the-art research on the topic[2]. The first method is an item response theory procedure called the area approach, where the area between the item characteristic curves for males and females is compared. The second method is a non-parametric contingency table procedure called the Mantel-Haenszel (MH), which uses a chi-square statistic to test the null hypothesis that there is no relation between group membership and test performance on each item after the males and females are matched on total test score. The third method is a multidimensional approach to modelling differential item functioning, called the Simultaneous Item Bias Test (SIBTEST), where differences in the probability of correct response across all ability levels for the test items are compared between males and females[3].

Since each method is based on different assumptions about the data, similar results across the three methods would provide stronger evidence that differential item functioning is occurring on the Social Studies 30 diploma examination. These three methods do, however, have one important commonality: students are matched on total test scores before their performance at the item level is compared. For example, item performance for males who scored 41 on the Social Studies 30 diploma examination is compared only with that of the females who scored 41. This correction helps ensure that the male and female examinees are similar to one another before their performance is compared, and has a distinct advantage over test score means because the data are analyzed by item and by achievement level. Items that functioned differently for males and females were reviewed by the Social Studies test development specialists to identify any anomalies associated with these items.

The results across the three methods were very similar. The majority of multiple-choice questions did *not* display differential item performance when males and females were compared. Using a three-tiered rating system developed by the Educational Testing Service in the United States, differential item functioning on the June 1996 administration of Social Studies 30 examination was characterized as follows: 65 of the 70 items had negligible DIF effects, five of the 70 items displayed moderate DIF effects, and none of the items displayed large DIF effects. For the five items identified with moderate differential item functioning, three items favoured males and two items favoured females. The five flagged items were then reviewed by the Social Studies test development specialists, but no systematic or substantive problems were identified.

The low level of bias detected on the June 1996 examination cannot adequately account for the mean difference of approximately 5% between the total scores of male and female students. This suggests that the difference in test performance may be due to environmental factors that are external to the examination. However, precise identification of those factors goes beyond the scope of this study and the mandate of the Student Evaluation Branch. Nevertheless, this question is certainly worthy of ongoing investigation.

Despite these positive findings, much work remains. Our immediate task is to review the Social Studies diploma exam longitudinally, as a way of identifying trends over time. A better understanding of substantive differences between males and females on the Social Studies 30 test items will help us identify and isolate irrelevant factors that may contribute to gender differences in exam performance. In addition, we expect to apply these methods to the other diploma examination areas in an attempt to identify and understand group differences, and to continue to ensure that our tests are fair for all examinees.

[2] Both the item response theory and the Mantel-Haenszel methods are carefully described in a recent book by Gregory Camilli and Lorrie Shepard called *Methods for Identifying Biased Test Items* published by Sage in 1994.

[3] See Shealy, R. T. & Stout, W. F. (1993), An item response theory model for test bias and differential item functioning in P. Holland & H. Wainer (Eds.), *Differential Item Functioning* (p. 197–239), Hillsdale, NJ: Erlbaum, for a detailed description of SIBTEST.

Section 6

Achievement-Over-Time Studies

An important goal at Alberta Education is to answer the question:

Has student achievement, as measured by the diploma examinations, changed over time?

To answer this question, we use a statistical method called linear equating that allows us to compare test scores over time.

New diploma examinations are developed each year, so it is not possible to make direct comparisons of achievement from one year to the next. Re-administration of old diploma examinations does not give an accurate indication of changes to student performance because students use old examinations for practice. To overcome this problem, each year a sample of students writes an anchor test.

Machine-scorable anchor tests are designed and developed to be parallel to the machine-scorable components of each diploma examination. They consist of a set of questions having the same content and focus as the machine-scorable component of the diploma examination. Student performance on these common items provides a basis of comparison for evaluating achievement over time.

Table 6.1 presents the number of students who wrote the anchor tests each year. Only students with current school-awarded and diploma examination marks are included in the samples.

The questions from these anchor tests are not released to the public and are administered again in the anchor tests of subsequent years. Following the administration and scoring of the diploma examinations, a student's anchor test mark is matched with his or her machine-scored mark on a diploma examination.

Results from the anchor tests are compared between yearly administrations and are used to compare achievement on the machine-scorable components of the respective examinations.

In English, only the reading component, which is 50% of the student's examination mark, is compared using this method. A qualitative study, *Patterns and Processes: Approaches to Writing by Grade 12 Students* (1990), reviewed student written work in English 30, Social Studies 30, and English 33.

During the first year of the achievement-over-time studies, 1989, anchor tests were administered in English 30, English 33, and Social Studies 30. Anchor tests were not administered in Mathematics 30, Biology 30, Chemistry 30, and Physics 30 until June 1990.

For Mathematics 30, no comparisons are made to results for 1991 or earlier because of changes made to the curriculum in 1991. Similarly, for Biology 30, no comparisons are made to results for 1994 or earlier because of changes made to the curriculum in 1995.

Table 6-1

Number of Students Writing the Anchor Tests

Course	1989	1990	1991	1992	1993	1994	1995	1996
English 30	360	319	297	352	364	207	346	285
English 33	264	298	249	114	305	146	262	204
Social Studies 30	634	464	303	378	327	238	309	220
Biology 30	N/A	N/A	N/A	N/A	N/A	N/A	380	221
Chemistry 30	N/A	160	291	327	300	229	305	252
Physics 30	N/A	74	N/A	224	228	104	272	230
Mathematics 30	N/A	N/A	N/A	444	272	228	360	286

N/A — not applicable in this year. No anchor test was administered.

Equating Procedure

To place the results of different tests on the same scale, all scores are reported on the score scale from a baseline year. The baseline year for the diploma examinations program is 1992. Linear equating is used to equate the results from each diploma examination to the baseline.

The equating method allows a student's score to be transformed onto the scale of the baseline year. That is, by applying the equating function calculated for English 30 students who wrote the June 1996 administration of the examination, it is possible to transform that score onto the June 1992 English 30 score scale as a way of comparing achievement over time.

For Physics 30, only the multiple-choice component of diploma examinations was used to equate 1990 results to 1992 results.

Results

Table 6-2 and Figure 6-1 show the mean percentage scores equated to the 1992 scores for the machine-scored component of the diploma examinations. These scores can be used to compare the provincial achievement of each year with that of the baseline year. Differences are considered significant when the probability due to chance is equal to or less than 1% ($p = 0.01$).

Has achievement, as measured by the diploma examinations, changed over the past few years?

- In **English 30**, the level of achievement on the machine-scored component of the diploma exam was significantly higher in 1996 than in 1989, 1990, 1991, and 1992.
- In **English 33**, there has been no significant change in the level of student achievement on the machine-scored component of the diploma examination since 1989.
- The 1993 and 1995 **Social Studies 30** results were significantly better than the results obtained in 1989 and 1990. The 1993 results were better than the 1992 results. The 1996 results were also better than the 1989 results.
- In **Biology 30**, the 1996 results were not significantly different from the 1995 results.
- In **Chemistry 30**, the 1996 results were significantly higher than the 1991 and 1994 results.
- In **Physics 30**, the 1996 results were significantly better than the results for 1990, 1992, 1993, and 1994. In addition, the results for 1994 were significantly lower than the results for 1992, 1993, and 1995.
- In **Mathematics 30**, student achievement has shown significant improvement each year.

Table 6-2

Equated Average Percentage on the Machine-Scored Component of the Diploma Examinations

Course	1989	1990	1991	1992[1]	1993	1994	1995	1996
English 30	68.5	68.1	68.2	67.5	69.3	69.4	70.0	71.2[2]
English 33	64.2	64.7	63.7	64.2	64.8	67.1	65.8	65.9
Social Studies 30	63.8	64.4	66.4	65.4	68.2[3]	66.3	68.1[4]	67.3[5]
Biology 30	N/A[6]	N/A[6]	N/A[6]	N/A[6]	N/A[6]	N/A[6]	68.4	69.6
Chemistry 30	N/A[6]	68.7	65.4	67.5	66.7	65.5	65.7	69.0[7]
Physics 30	N/A[6]	70.9	N/A[6]	70.5	68.9	60.5[8]	72.5	75.7[9]
Mathematics 30	N/A[6]	N/A[6]	N/A[6]	62.0	65.3[10]	70.0[11]	73.5[12]	76.6[12]

[1]Baseline year: actual percentage on machine-scored component of diploma examination.
[2]Equated mean is significantly larger than means for 1989 to 1992.
[3]Equated mean is significantly larger than means for 1989, 1990, and 1992.
[4]Equated mean is significantly larger than means for 1989 and 1990.
[5]Equated mean is significantly larger than the mean for 1989.
[6]N/A indicates that the anchor tests were not administered or not applicable.
[7]Equated mean is significantly larger than means for 1991 and 1994.
[8]Equated mean is significantly smaller than means for 1992, 1993, 1995, and 1996.
[9]Equated mean is significantly larger than means for 1990 and 1992 to 1994.
[10]Equated mean is significantly larger than mean for 1992.
[11]Equated mean is significantly larger than means for 1992 and 1993.
[12]Equated mean is significantly larger than means for 1992, 1993, and 1994.

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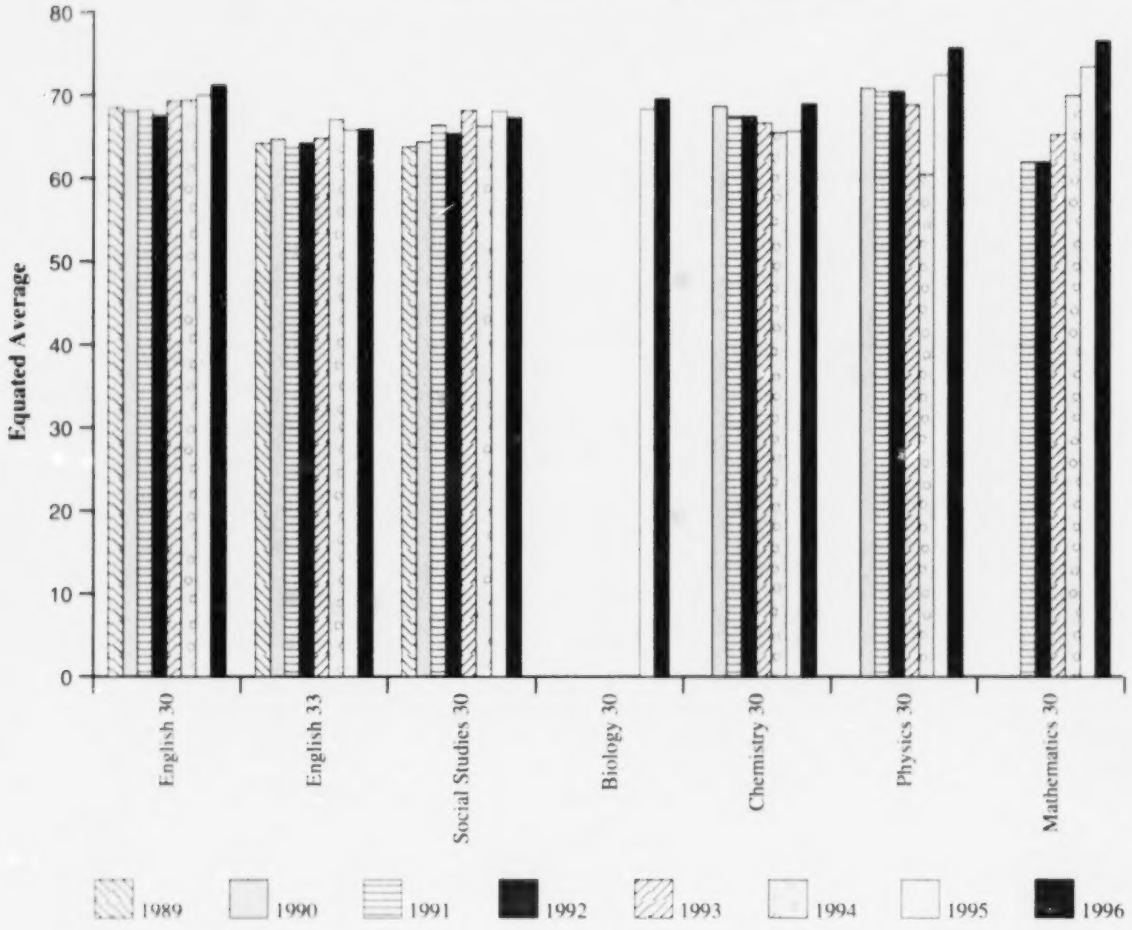
Figure 6-1

Achievement-Over-Time Results on Diploma Examinations



Section 7

Examiners' Annual Summary Statements

This section of the report describes how well students met performance standards in the eleven diploma examination courses. Each summary statement addresses three questions:

- What are the characteristics of the student population that wrote the examinations?
- What is the overall performance of students on the examinations?
- Do the population and performance data reveal any significant trends?

Consistent with most of the data presented in sections 3 through 6, the data in this section of the report are based only on the results of students who had both diploma examination and school-awarded marks.

Consequently, the figures provided here are slightly different from the figure on page 3, which describes a broader population.

English 30

What are the characteristics of the student population that wrote the examinations?

In 1995–96, 21 604 students with corresponding school-awarded marks wrote the English 30 diploma examinations. This number, representing approximately 67% of all students writing English 30 or English 33 diploma examinations in 1995–96, has decreased by 1 440 (6.8%) students since 1994–95.

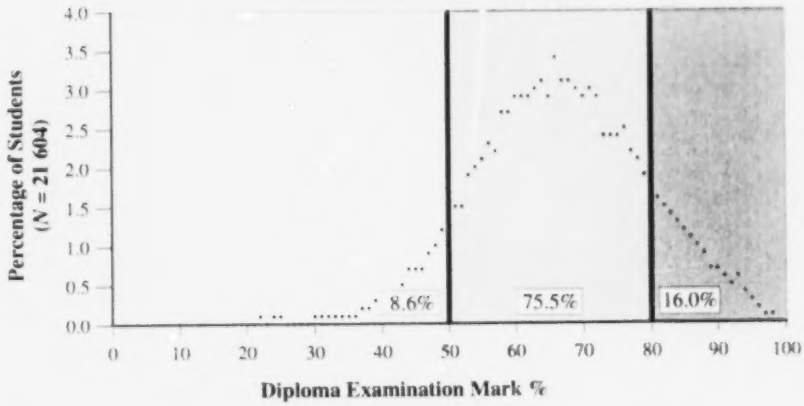
English 30 is a course "appropriate for students intending to pursue further academic studies" (*Senior High School Language Arts 1982 Curriculum Guide*, page 6). Participation data suggest that a high proportion of students expecting to graduate are attempting to keep their options open with regard to future academic study by enrolling in English 30.

The English 30 population comprises more females than males. About 55% of students writing the English 30 diploma examinations are female; 45% are male (see Section 3).

In the last three years, about 8% of those writing English 30 were atypical in that they were either repeating English 30 or challenging English 30 (see Table 7-1). Special studies have shown that students who rewrite English 30 without instruction usually do not improve their marks, while students who rewrite without instruction in courses other than English score average mark increases of 5 to 10%. Students who choose to challenge the examination without classroom instruction usually pass the examination but often do not achieve marks high enough to gain entrance to further academic studies.

Figure 7-1

English 30
Distribution of Diploma Examination Marks
1995–96 School Year



Students achieving the *acceptable standard* but not the *standard of excellence*.

Students achieving the *standard of excellence*.

What is the overall performance of students on the examinations?

The overall performance of students writing the English 30 diploma examinations during 1995–96 was similar to that in previous years. However, in comparison with previous years, a higher proportion of students achieved diploma examination marks at or above the *standard of excellence*. Consistency of performance is reflected in the achievement-over-time studies conducted over the past seven years (see Section 6).

In 1995–96, a significant proportion of the students writing English 30 (91.5%) attained diploma examination marks at or above the *acceptable standard*, and 16% attained diploma examination marks at or above the *standard of excellence* (see Figure 7-1). Although

8.6% did not achieve the *acceptable standard*, most of these students (6.8% of all students) attained marks ranging from 40% to 49%. Some of these students might achieve the *acceptable standard* if they were to receive further instruction.

Acceptable Standard

Students who achieved at or slightly above the *acceptable standard* on the Minor Assignment: Reader's Response to Literature were able to understand the reading selection presented in *Part A: Written Response* and were able to relate their personal responses to details from that selection. For the most part, their writing was organized effectively.

In responding to the Major Assignment, students achieving at or slightly above the *acceptable standard* presented a clear controlling idea that reflected a basic understanding of the chosen literary work, but not always an understanding of the author's purpose or the wider implications of the literature. That is, students located a character or characters who illustrated a quality suggested by the topic, but they usually did not explore what the author was saying through that character.

Students achieving at or slightly above the *acceptable standard* organized their writing in a mechanical or functional way, giving clear direction to the reader. Occasionally, however, these students simply recounted parts of the story. Students writing at this level usually used language in a correct, practical way to "get the job done" rather than to enhance the details that they were communicating or to illustrate ideas for the reader.

As in the past, students at this level continued to demonstrate some awareness of control of the stylistic choices and the conventions of written

Table 7-1

English 30 Diploma Examination
Five-Year Comparison by Population Percentage and Achievement Averages

Year	Subgroup	Grade 11 Students	Grade 12 Students	Atypical Exam Writers*	Transferred in From Outside the Province
1995–96	Percentage of Population	2.6	87.0	7.5	4.4
	Examination Average	63.6	67.4	61.3	62.3
1994–95	Percentage of Population	2.1	84.6	8.6	4.7
	Examination Average	61.7	65.0	59.0	60.2
1993–94	Percentage of Population	1.5	83.4	10.0	5.1
	Examination Average	60.1	63.7	58.7	58.8
1992–93	Percentage of Population	1.7	82.7	10.1	5.4
	Examination Average	60.8	63.5	58.5	58.5
1991–92	Percentage of Population	1.6	82.8	9.7	5.9
	Examination Average	61.9	64.3	59.2	59.9

*This group includes repeaters, individuals challenging the examinations, and students without a school-awarded mark.

Table 7-2

English 30
Five-Year Comparison of Selected Population and Achievement Indicators

	1991–92	1992–93	1993–94	1994–95	1995–96
Number of Students with a School-Awarded Mark	24 027	24 489	24 494	23 074	21 604
Male/Female Proportions (%)	45/55	45/55	45/55	45/55	45/55
Students Achieving *Acceptable Standard* on Diploma Exam (%)	89.0	87.9	87.2	87.2	91.5
Students Achieving *Standard of Excellence* on Diploma Exam (%)	10.9	9.6	10.4	12.7	16.0

language. While such problems as pronoun–antecedent agreement and subject–verb agreement did appear in the writing, more pervasive and serious were errors involving word usage and confusion of syntax. However, the fact that students with final course marks in the mid-range (60% to 70%) can and do produce some well-written sentences suggests that they have the potential to move from "acceptable" to "proficient" in their writing.

In responding to *Part B: Reading*, students who achieved at or slightly above the *acceptable standard* demonstrated that they were generally capable of effective close reading and of understanding difficult material, especially non-fiction. These students were often unsuccessful, however, on vocabulary and other complex questions requiring closer examination, recognition of contextual clues, and rereading of the passage.

Standard of Excellence

Students who achieved the *standard of excellence* on *Part A: Written Response* produced writing that displayed confidence in ideas, organization, and choice of language. Writing at this level reflected a sensitivity to the emotional tone of the reading selection and also reflected an appreciation of the importance of lively, concrete detail in personal responses. Often, there was a mature understanding of the significance of the topic within the greater scope of human endeavor.

In responding to the Major Assignment, students at this level of achievement demonstrated a perceptive understanding of literature. They were able to use the topic as a springboard to a focused, engaging, thorough examination of a chosen work of literature. Students who achieved the *standard of excellence* were confident but thoughtful in presenting their ideas and opinions. Their ability to use language effectively to enhance their expression also suggested confidence.
In responding to *Part B: Reading*, students achieving the *standard of excellence* demonstrated that they had highly developed skills in close reading. These students also achieved noticeably higher scores on questions requiring competence in vocabulary. Students at this level were successful at reading critically and responding precisely to complex literary works such as Shakespearean drama and poetry dense with imagery.

Do the population and performance data reveal any significant trends?

Table 7-2 provides a comparison over the last five years of selected population and performance indicators. The continual increase in numbers between 1991–92 and 1993–94 of students writing the diploma examination in English 30 ended in 1994–95. In 1995–96, 860 fewer students (3.8%) wrote English 30 than in 1994–95. In 1995–96, a significantly higher percentage of English 30 students achieved the *acceptable standard* compared with the previous four years. Approximately the same percentage increase also occurred at the *standard of excellence*. Perhaps students have benefited from the information provided in last year's *Students First* document.

English 33

What are the characteristics of the student population that wrote the examinations?

In 1995–96, 11 381 students with corresponding school-awarded marks wrote the English 33 diploma examinations. This is approximately 35% of all such students who wrote the English 30 or English 33 diploma examinations in 1995–96. Generally, students who write English 33 write few (if any) other diploma examinations (see Figure 2-3).

English 33 is a course "appropriate for students intending to go to vocational school or to seek employment after leaving high school" (*Senior High School Language Arts 1982 Curriculum Guide*, page 6). The fact that so few English 33 students were enrolled in other diploma examination courses may indicate that these students did, indeed, plan to enter the workforce immediately upon graduation.

In 1995–96, as in previous years, English 33 was selected by more male students than female students. Also, as can be seen in Table 7-3, atypical examination writers formed 9.7% of the total number of individuals who wrote English 33 diploma examinations in 1995–96 (N = 12 198). This proportion is much higher than that for other diploma examinations (for example, 3.7% in Social Studies 30) and suggests that many individuals who are writing English 33 diploma examinations are challenging the examination or are repeating. The overall achievement of atypical examination writers is higher than the overall achievement for other groups, as shown in Table 7-3. Again, this is unusual for diploma examination courses in that the overall achievement of similar groups of atypical examination writers in other courses is, without exception, lower than for the other groups shown in the tables. (See Tables 7-1, 7-3, 7-5, 7-7, and 7-10.)

What is the overall performance of students on the examinations?

The overall performance of the 11 381 students with corresponding school-awarded marks who wrote the English 33 diploma examinations this past school year was generally satisfactory. In 1995–96, 85.7% of students writing English 33 attained diploma examination marks at or above the *acceptable standard* and 6.9% attained diploma examination marks at or above the *standard of excellence* (see Figure 7-2). The proportion of students who did not achieve the *acceptable standard* was 14.4%, but 11.1% attained marks ranging from 40% to 49%. Only 3.3% of the students attained marks of 39% or lower.

Acceptable Standard

Students who achieved at or slightly above the *acceptable standard* were able to respond clearly and correctly to all three assignments in *Part A: Written*

Response. They demonstrated a clear understanding of the reading selection in their responses to Section I: Personal Response to Literature, and they addressed the assignment in a conventional manner. These students discussed life experiences and themes understanding of the reading selection in their responses to Section I: Personal Response to Literature, and they addressed the assignment in a conventional manner. These students discussed life experiences and themes from literature in perfunctory but acceptable ways.

Students achieving at or slightly above the *acceptable standard* provided satisfactory responses to Section II: Functional Writing. These students used the information provided in the assignment to fulfill their purposes sufficiently and were able to adopt an appropriate tone that demonstrated an awareness of audience. They were able to organize their work logically and clearly.

When responding to Section III: Response to Visual Communication, these students tended to interpret the photograph in conventional ways, using generalized observations for support. Students who just met the *acceptable standard* on *Part A: Written Response* provided few specific details in their writing. Writing skills demonstrated by these students were minimally acceptable.

In responding to *Part B: Reading*, students who achieved at or slightly above the *acceptable standard* were able to understand reading selections that were intended for a general audience. They were able to draw some inferences from context and to apply basic concepts such as metaphor and foreshadowing. However, these students had difficulty understanding and interpreting irony and other tonal qualities.

In responding to the revision assignments on *Part B: Reading*, in which students were required to make decisions about appropriate revisions to the draft of a letter, many students achieving at or slightly above the *acceptable standard* appeared to understand the rationale behind revisions in areas such as syntax, diction, and conventions. What was discouraging was that many of these students did not transfer this apparent understanding to their own writing on *Part A: Written Response*.

Standard of Excellence

Students who achieved the *standard of excellence* generally produced work of superior quality on all of the assignments in *Part A: Written Response*. When responding to Section I: Personal Response to Literature, students at this level usually interpreted the assignment in an insightful way. They presented significant themes or ideas and used precise examples from life and literature to support their themes. Many of these students responded to the universal implications of the selections and explored topics in a perceptive manner. These students used precise, thoughtfully chosen, and often imaginative details. They were able to select examples and illustrations from reading selections, from their own experience, and from other literature to fulfill their purpose. Their writing was focused, coherent, and smoothly developed. They used words and structures that were effective and basically free from errors. These students projected confidence in their writing.

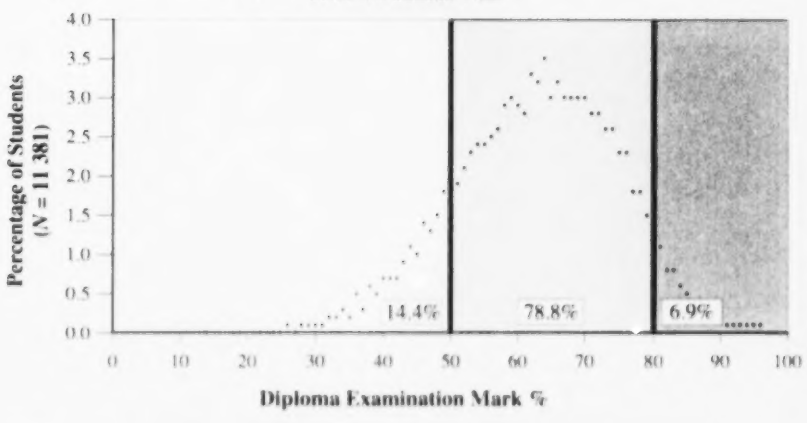
When responding to Section II: Functional Writing, students achieving the *standard of excellence* used an appropriate and engaging tone. They provided significant information that was enhanced by appropriate details. These students had a precise awareness of audience, and they provided important and essential information necessary for their purpose. Writing skills demonstrated at this level were relatively even; word choice and sentence structure were appropriate and often effective, and there were few errors in mechanics and grammar.

When responding to Section III: Response to Visual Communication, students achieving the *standard of excellence* presented insightful interpretations of the photograph, stating appropriate themes or ideas. Their ideas were typically extended and reinforced throughout their compositions. These students chose specific elements from the photograph to support their ideas. They made few mechanical or grammatical errors and produced relatively lengthy responses.

When responding to *Part B: Reading*, students achieving the *standard of excellence* demonstrated an understanding of relatively complicated literature. They were able to delve beyond the literal level of a work to make inferences from important features such as irony and symbolism. These students demonstrated that they read carefully and thoughtfully the selections and all parts of each question before answering.

Figure 7-2

English 33
Distribution of Diploma Examination Marks
1995–96 School Year



Do the population and performance data reveal any significant trends?

Table 7-4 provides a comparison over the last five school years of selected population and performance indicators.

The proportion of male and female students writing the English 33 diploma examinations has remained relatively constant over the past five years, but this difference in proportion is unusual for diploma examination subjects (see Figure 3-1).

The proportion of students achieving the *acceptable standard* in English 33 declined between 1994–95 and 1995–96, but the proportion in 1995–96 was higher than it was in 1993–94. The increase in proportion of students achieving the *standard of excellence* between 1994–95 and 1995–96 bodes well, but it is too early to suggest that this increase is significant or that it indicates a "trend." The low proportion of students achieving the standard of excellence in English 33 continues to be a concern and may indicate that few students taking this course are motivated to achieve high marks.

Table 7-3

English 33 Diploma Examination

Five-Year Comparison by Population Percentage and Achievement Averages

Year	Subgroup	Grade 11 Students	Grade 12 Students	Atypical Exam Writers*	Transferred in From Outside the Province
1995–96	Percentage of Population	6.5	79.5	9.7	4.3
	Examination Average	61.0	63.0	63.8	60.8
1994–95	Percentage of Population	5.7	78.8	11.3	4.2
	Examination Average	60.9	61.9	66.7	60.1
1993–94	Percentage of Population	4.8	77.4	13.5	4.3
	Examination Average	61.4	61.1	62.9	59.7
1992–93	Percentage of Population	5.1	77.4	12.6	4.9
	Examination Average	60.9	61.9	63.6	60.0
1991–92	Percentage of Population	4.5	78.2	12.5	4.8
	Examination Average	62.9	62.2	64.5	60.3

*This group includes repeaters, individuals challenging the examinations, and students without a school-awarded mark.

Table 7-4

English 33

Five-Year Comparison of Selected Population and Achievement Indicators

	1991–92	1992–93	1993–94	1994–95	1995–96
Number of Students with a School-Awarded Mark	9 254	9 939	11 020	11 613	11 381
Male/Female Proportions (%)	58/42	58/42	56/44	56/44	56/44
Students Achieving *Acceptable Standard* on Diploma Exam (%)	87.3	86.2	85.0	86.1	85.7
Students Achieving *Standard of Excellence* on Diploma Exam (%)	5.5	5.5	5.1	5.1	6.9

Social Studies 30

What are the characteristics of the student population that wrote the examinations?

In 1995–96, 19 646 students with corresponding school-awarded marks wrote the Social Studies 30 diploma examinations. Generally, students writing Social Studies 30 also wrote other diploma examinations (see Figure 2-3). There is also a high correlation (0.76) between Social Studies school-awarded marks and Social Studies 30 diploma examination marks (see Section 2).

Social Studies 30 is a course designed for those students who are seeking a diploma and who will likely pursue academic post-secondary studies. The fact that many Social Studies 30 students took other diploma examination courses may indicate that most of these students plan to enter post-secondary institutions upon graduation.

Social Studies 30 was selected by more female than male students. In 1995–96, 10 306 female students and 9 340 male students wrote the Social Studies 30 diploma examinations. Also, as can be seen in Table 7-5, the size of subgroup populations and their success on the Social Studies 30 diploma examinations have been relatively constant over the years. The group of atypical examination writers has, however, tended to perform below that of the other population subgroups.

What is the overall performance of students on the examinations?

The overall performance of the 19 646 students with corresponding school-awarded marks who wrote the Social Studies 30 diploma examinations was satisfactory. In 1995–96, 84.3% of the students writing Social Studies 30 attained diploma examination marks at or above the *acceptable standard*, and 17.7% of the students attained diploma examination marks at or above the *standard of excellence* (see Figure 7-3). The proportion of students who did not achieve the *acceptable standard* was 15.8%, but 11.3% of students attained marks ranging from 40% to 49%. The percentage of students whose marks were 39% or lower was 4.6%.

Acceptable Standard

In answering the multiple-choice questions in Part A of the examination, students who achieved at or slightly above the *acceptable standard* were able to recall and comprehend certain historical events or economic and political concepts. Students just meeting the *acceptable standard* experienced difficulty, however, with questions involving chronology, various critical thinking skills, and the application of knowledge to new or unfamiliar situations. In particular, these students experienced difficulty with textual or data-based questions (such as those involving a cartoon, graph, map, or series of quotations) that required them to see relationships, interpret trends, understand cause and effect, or identify stated or unstated assumptions.

Many students who just met the *acceptable standard* had difficulty dealing with the complexity of the task on *Part B: Written Response*. Typically, these students presented largely descriptive essays containing both relevant and irrelevant detail. Many students who just met or who fell short of the *acceptable standard* had difficulty applying and integrating concepts and defining the issues. They appear to have rushed headlong into their writing, without planning their essays or considering the relevance of historical or contemporary examples associated with the issues under discussion.

Students who fell short of the *acceptable standard* often presented memorized information at random, rather than a thought-out discussion. They left the task of sorting out scattered facts to the reader. They presented popularly accepted versions of past or present events as unsupported, simple assertions. They often made little attempt to elaborate, explain, or develop ideas. Such writing received low scores.

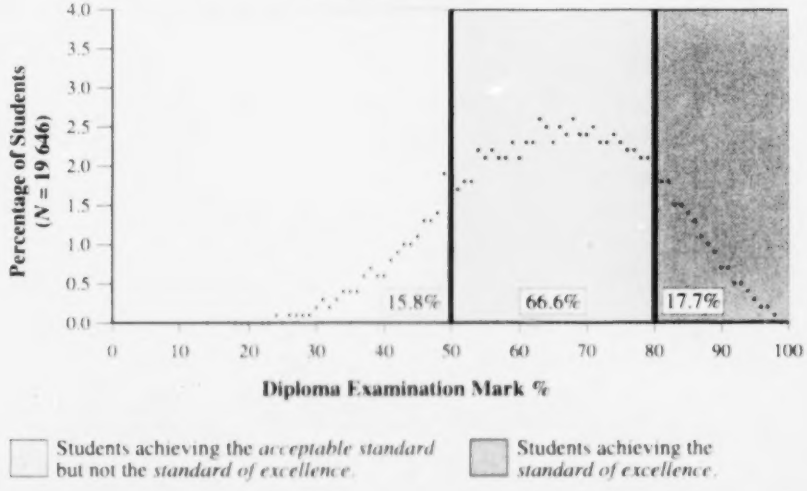
Standard of Excellence

In answering the multiple-choice questions in Part A, students achieving the *standard of excellence* demonstrated that they understood social studies concepts and comprehended historical, political, and economic relationships, many of which are very complex. They were consistently able to interpret and evaluate information and ideas, and to review, analyze, and synthesize specific information.

Students who achieved the *standard of excellence* often produced powerful and substantive writing in their responses to the assignment in *Part B: Written Response*. Given the

Figure 7-3

Social Studies 30
Distribution of Diploma Examination Marks
1995–96 School Year



complexity of the task and the constraints of time, some of these students' compositions were truly remarkable. Many of the responses of students achieving at this level revealed qualities of argument, support, development, and organization that exhibited a breadth of historical and contemporary knowledge. Students achieving the *standard of excellence* clearly showed ownership of the ideas they expressed; their writing revealed engaged minds thoughtfully immersed in issues relevant and meaningful to them. These students were comfortable in exploring ideas in their complexity.

Do the population and performance data reveal any significant trends?

Table 7-6 provides a comparison over the last five school years of selected population and performance indicators.

The number of students writing Social Studies 30 diploma examinations declined significantly from past administrations. Between 1993–94 and 1995–96, this decrease was 8.0%. The proportion of male and female students writing and the two performance indicators have remained relatively constant (see Table 7-6).

Although more females than males wrote the diploma examination in Social Studies, males continued to achieve higher averages than females: 66.1% compared with 62.6% in 1994–95, and 67.1% compared with 63.1% in 1995–96. On the multiple-choice component, in particular, males consistently achieve higher scores than females: 70.6% compared with 64.6% in 1995–96. This difference is not evident in the written response, where the averages in 1995–96 were 58.3% for males and 59.0% for females.

Student performance on the Social Studies 30 diploma examinations is showing some improvement over performance in previous years. The proportion of students achieving the standards remains relatively constant. Revisions to the examination blueprint, beginning in 1990, have emphasized the demonstration of cognitively demanding, critical-thinking skills in both the multiple-choice and written components of the examination. Given that standards have increased, it is encouraging that the proportions of students achieving standards have remained relatively consistent over the years.

Table 7-5

Social Studies 30 Diploma Examination
Five-Year Comparison by Population Percentage and Achievement Averages

Year	Subgroup	Grade 11 Students	Grade 12 Students	Atypical Exam Writers*	Transferred in From Outside the Province
1995–96	Percentage of Population	3.1	89.4	3.4	3.8
	Examination Average	62.1	62.5	56.9	64.4
1994–95	Percentage of Population	2.3	88.9	5.1	4.0
	Examination Average	63.6	64.4	57.7	63.7
1993–94	Percentage of Population	1.8	87.1	6.1	4.5
	Examination Average	60.5	63.6	57.2	62.3
1992–93	Percentage of Population	1.8	88.0	5.7	4.4
	Examination Average	60.5	62.1	60.0	61.1
1991–92	Percentage of Population	2.1	87.5	5.4	5.0
	Examination Average	60.5	62.6	55.8	61.3

*This group includes repeaters, individuals challenging the examination, and students without a school-awarded mark.

Table 7-6

Social Studies 30
Five-Year Comparison of Selected Population and Achievement Indicators

	1991–92	1992–93	1993–94	1994–95	1995–96
Number of Students with a School-Awarded Mark	20 804	21 098	21 351	19 745	19 646
Male/Female Proportions (%)	47/53	47/53	47/53	47/53	47/53
Students Achieving *Acceptable Standard* on Diploma Exam (%)	81.1	79.9	83.6	83.7	84.3
Students Achieving *Standard of Excellence* on Diploma Exam (%)	13.4	13.4	14.5	15.7	17.7

Social Studies 33

What are the characteristics of the student population that wrote the examinations?

Diploma examinations in Social Studies 33 were administered for the first time in the 1995–96 school year. These examinations were written by 11 894 students with corresponding school-awarded marks. Generally, students who wrote the Social Studies 33 examinations also wrote several other diploma examinations; however, the average number of diploma examinations written by these students was less than that for most other diploma examination courses. Social Studies 33 is a course designed for students intending to seek employment immediately after completing high school or for students planning to attend a post-secondary education institution and to major in a field other than the social sciences. The fact that Social Studies 33 students were enrolled in few other diploma examination courses may indicate that many of these students did, indeed, plan to enter the workforce upon completion of high school.

In 1995–96, Social Studies 33 was selected by more male students than female students. This proportion is almost the reverse of the proportion of male to female students enrolled in Social Studies 30.

Also, atypical examination writers formed 6.0% of the total number of individuals who wrote Social Studies 33 diploma examinations in 1995–96 (*n = 12 121*). Although this proportion is lower than in English 33, it is somewhat higher than in Social Studies 30. This suggests that a significant proportion of the individuals who are writing Social Studies 33 diploma examinations are challenging the examination or repeating the course. The overall achievement of atypical examination writers is marginally lower than that of other groups, a trend that is consistent with most other diploma examination courses.

What is the overall performance of students on the examinations?

The overall performance of the 11 894 students with corresponding school-awarded marks who wrote the Social Studies 33 diploma examinations was satisfactory. In 1995–96, the *acceptable standard* was achieved by 83.1% of students who wrote the Social Studies 33 diploma examination, and the *standard of excellence* by 7.9%. The proportion of students who did not achieve the *acceptable standard* was 16.9%, but 11.8% attained marks ranging from 40% to 49%. Only 5.1% of the students attained marks of 39% or lower.

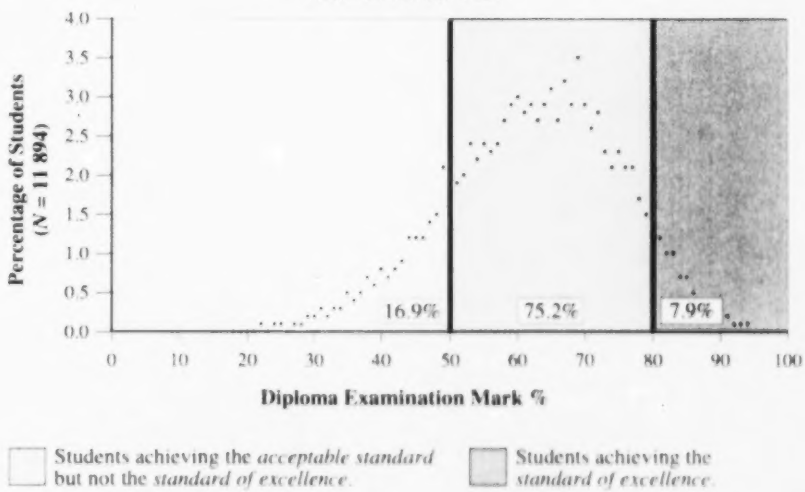
Acceptable Standard

In answering the multiple-choice questions, students at or slightly above the *acceptable standard* were able to recall and comprehend some historical events and basic political and economic concepts. They were also able to interpret and apply ideas and information presented in multiple-choice question data sources, although success diminished for the more complex and challenging sources and associated questions.

The great majority of students who achieved at or slightly above the *acceptable standard* responded to each of the four writing assignments on an examination. The written work of these students showed that they had a basic understanding of social studies concepts and their application in real-world situations. It was relatively common for students at or slightly above the *acceptable standard* to correctly recall and apply factual information but to lack the breadth and depth of knowledge demonstrated by students achieving the *standard of excellence*. Responses were commonly sincere, with many students developing links between the writing tasks and their own lives. Students who achieved at or slightly above the *acceptable standard* demonstrated satisfactory written communication skills. Written works typically contained appropriate but generalized vocabulary. Students at this standard demonstrated satisfactory control of sentence construction, grammar, and mechanics. Overall, such works were functionally organized and the student's meaning was relatively clear. On the writing assignments, student scores for the *Communication of Ideas* scoring category were, as a rule, slightly higher than for the *Ideas and Support* scoring category.

Figure 7-4

Social Studies 33
Distribution of Diploma Examination Marks
1995–96 School Year



Standard of Excellence

In answering the multiple-choice questions in Part A, students achieving the *standard of excellence* demonstrated that they understood social studies concepts and comprehended fundamental historical, political, and economic relationships. They were able to interpret and evaluate information presented in relatively complex multiple-choice data sources with minimal difficulty.

The written compositions of students achieving the *standard of excellence* typically provided a more panoramic perspective than the written compositions of students achieving at or slightly above the *acceptable standard*. Students achieving the *standard of excellence* not only developed links between a writing task and their own lives but also typically expanded upon this base to discuss the broader implications related to the task. Students at the *standard of excellence* demonstrated competent-to-excellent written communication skills. These students were able to use specific and appropriate vocabulary, and demonstrated confident control of sentence construction, grammar, and mechanics. The compositions of students achieving the *standard of excellence* were effectively organized and their meaning was easily understood.

Do the population and performance data reveal any significant trends?

Given that Social Studies 33 diploma examinations were administered for the first time in the 1995–96 school year, it is not possible to identify trends. However, student achievement in the first year of administration clearly met the expectations of the educational professionals involved in designing the examination and in establishing the standards applied to the evaluation of student work.

Français 30

What are the characteristics of the student population that wrote the examinations?

Français 30 is the final course of the Français 10-20-30 program designed for francophone students as defined in Section 23 of the *Canadian Charter of Rights and Freedoms*. Students enrolled in Français 30 are required to write the Français 30 Diploma Examination.

In the 1995–96 school year, there were 62 regular school students who wrote the Français 30 diploma examinations. One mature student wrote the Français 30 examination and 65 students from an immersion program also challenged the Français 30 diploma examinations, for a total of 128 written examinations. Because very few students wrote at each administration, results must be interpreted with caution.

What is the overall performance of students on the examinations?

The overall performance of the 62 regular school students who wrote the Français 30 diploma examinations in the 1995–96 school year was very good. All attained final course marks at or above the *acceptable standard*, and six achieved the *standard of excellence*.

Most of the students enrolled in Français 30 wrote an average of five diploma examinations. This indicates that most of these students were hoping to receive the Advanced High School Diploma.

La Partie A: Production écrite

The written-response section of the Français 30 diploma examinations required students to write two assignments related to a selection from a work of literature presented on the examination. The first assignment, "Premier sujet," elicited a personal response to the selection. The second, "Deuxième sujet," asked students to select a work of literature studied in their high school Français class and to relate it to a given theme inspired by the selection presented on the examination.

Students were able to understand the tone and content of the given literature and to respond clearly and effectively. For the personal response, they expressed their opinions and reactions with confidence. Most took the more obvious approach to the question by supporting the given theme, and a few were able to present an opposing view successfully. Examples taken from their own experiences or from general observations were usually appropriate and often interesting. Although the writing of students just meeting the *acceptable standard* was sometimes wordy and repetitious, the meaning was clearly understandable. Students achieving the *standard of excellence* were able to present their ideas succinctly, directly, and emphatically.

In the second assignment, students had no difficulty selecting works that reflected the given theme. Students achieving the *standard of excellence* used significant details from chosen literature to show how the given theme was developed by the author or authors. Students just meeting the *acceptable standard* tended to choose more minor details or to repeat one significant detail, with less effect. All students, however, were able to convince the readers of the relationship between what they had read and what the assignment required. Students have learned well how to organize their ideas, how to choose effective vocabulary and structures, and generally how to follow conventions of language.

It must be remembered that students are writing in a limited time under examination conditions and that their work is considered a first draft. Under these conditions, what they achieved was impressive and often a pleasure to read.

La Partie B: Compréhension écrite

The reading comprehension section of the Français 30 diploma examinations consisted of two booklets. The readings booklet contained selections from fiction, non-fiction, poetry, and drama. The questions booklet contained 70 multiple-choice questions based on these readings. The questions were classified according to thinking skills.

Students' performance was generally satisfactory. They were able to identify and select, infer, interpret, and evaluate main ideas. They were also able to recognize the rapport between the author and the reader, as well as discern values expressed. Students achieving the *standard of excellence* seemed better able to discern the nuances required to choose the right answer in some questions. Students achieving the *acceptable standard* usually did well on the questions requiring a literal understanding. These students should be encouraged to refer back to the reading selections when contemplating their choice of answers. This could help them to perceive more of the nuances of the text.

Do the population and performance data reveal any significant trends?

Because the number of students enrolled in the course is extremely small, no comments can be made on trends in the data.

Mathematics 30

What are the characteristics of the student population that wrote the examinations?

Mathematics 30 is a course "designed for students with an interest and aptitude in mathematics, who are intending to pursue post-secondary studies at a university or in a mathematics-intensive program at a technical school or college." (Senior High School Mathematics 10-20-30 Curriculum Guide, page 2)

In 1995–96, 18 656 students with corresponding school-awarded marks wrote the Mathematics 30 diploma examinations. This is a decrease of 614 students since 1994–95. The Mathematics 30 population comprises slightly more females than males: about 50.5%, compared with 49.5%.

What is the overall performance of students on the examinations?

In 1995–96, the mean mark on the Mathematics 30 diploma examination was 61.9% with a standard deviation of 18.2. Of the students writing Mathematics 30, 74.3% attained diploma examination marks at or above the *acceptable standard*, which is 0.9% higher than in the 1994–95 school year.

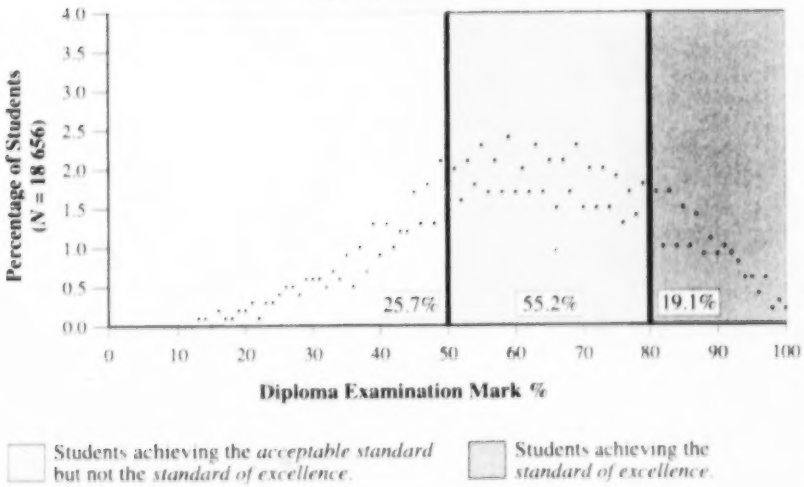
The percentage of students who achieved the *standard of excellence* rose from 17.0% in 1994–95 to 19.1% in 1995–96 (see Figure 7-5). During the 1995–96 administrations, 25.7% of the students did not achieve the *acceptable standard*, a decrease of 0.8% from the 1994–95 administration (see Figure 2-14).

About 4% of the students who wrote the Mathematics 30 diploma examinations were either challenging or rewriting the examination. Regular non-mature students scored an average of 63.0%, whereas regular, non-mature students who rewrote the examination (school mark brought forward) scored an average of 64.2%. Regular mature school students scored an average of 55.7%; whereas mature school students who rewrote the examination (school mark brought forward) scored an average of 47.0%. Mature students who were challenging the examination scored an average of 43.6% (see Table 4-14).

Standards for the Mathematics 30 diploma examinations for the 1995–96 school year were published in the *Mathematics 30 Diploma Examination Information Bulletin*. The emphases on problem solving and communication skills in the Mathematics 30 curriculum were incorporated into the examination. Students were expected to describe mathematical situations, explain their solutions and their reasoning, create new problems and strategies, generalize a mathematical situation, and formulate hypotheses. The Mathematics 30 examiners' reports outline the scoring criteria for these questions.

Figure 7-5

Mathematics 30
Distribution of Diploma Examination Marks
1995–96 School Year



Acceptable Standard

Students who achieved the *acceptable standard* of performance but not the *standard of excellence* (55.2%) were able to solve problems involving more than one step as long as the information provided was given in a "standard" form and could be referenced on the formula sheet. In permutations and combinations, for instance, students were able to calculate the number of linear, circle, or ring permutations, and permutations with repetitions of n things taken r at a time but were not able to explain the reason that there are different numbers of permutations when a given number of objects is arranged in a line, a circle, or a ring, or when some of the objects are repeated or identical. For the most part, students in this group were able to recognize relationships between mathematical concepts, but only so long as these relationships were presented in a specific sense. Many were not able to identify the relationships in the general case. For example, these students were able to write the specific terms of an arithmetic or geometric sequence, given a defining function, but were not able to determine a function describing any sequence that has a recognizable pattern, nor were they able to identify and explain conditions necessary for a sequence to meet given requirements.

Students who did not achieve the *acceptable standard* of performance on the Mathematics 30 diploma examinations (25.7%) had difficulty solving problems other than those that required solving for a single piece of information using a formula provided on the formula sheet. These students were able to solve problems that required a one-step calculation, such as finding the value of a z-score, given the values of the variables required to substitute into a given formula. However, these students were not able

to complete multistep problems that required them to apply the z-scores of data normally distributed, such as the example given in the standards section of the *Mathematics 30 Information Bulletin*.

Standard of Excellence

Students who achieved the *standard of excellence* in Mathematics 30 (19.1%) had little difficulty solving any problems, regardless of the number of steps required. They recognized and were able to describe relationships between mathematical concepts in both the specific and the general cases. For example, given the first term and the common difference of an arithmetic sequence, and the graphical representation of the sum of the terms for this sequence, students who achieved at the *standard of excellence* were able not only to algebraically show why two specific arithmetic sums were equal and provide a specific example of an arithmetic sequence for which the sums would never be equal, but were also able to clearly identify and explain, in a general manner, the conditions necessary for an arithmetic sequence to have equality of sums for a specific number of terms (Written Response 2, Mathematics 30 June, 1996 Diploma Examination).

Do the population and performance data reveal any significant trends?

There has been an increase of approximately 3% of the student population scoring at the *acceptable standard* on the diploma examination since 1993–94. However, students who are enrolled in Mathematics 30 continue to have difficulty using mathematics as a precise language to reason with, and interpret in a problem-solving context, beyond a memorization of algorithms. In particular, students use a limited number of strategies in the solution of mathematical problems and do not routinely look back over a solution to a problem (Mathematics 30 Course of Studies, pages 6–7). It is interesting to note that many students rely on previously learned mathematical ideas for problem solving, rather than the mathematics used in Mathematics 30.

Communication skills in mathematics are improving in that students are willing to make some attempt on the written-response section of the Mathematics 30 diploma examinations, and there are fewer papers with no responses. Results from the Achievement-Over-Time Mathematics 30 examination continue to show significant improvement over the years 1992–96.

Mathematics 33

What are the characteristics of the student population that wrote the examinations?

Mathematics 33 is a course "designed for students who require mathematics to prepare them for many post-secondary programs at university, colleges, trades, and employment." (Senior High School Mathematics 13-23-33 Course of Studies, page 2)

The new Mathematics 33 examination has been designed to include scenarios that allow students to demonstrate their required mathematical understandings in situations similar to those they will encounter in post-secondary programs, colleges, trades, employment, and real life.

In the 1995–96 school year 10 391 students with corresponding school-awarded marks wrote the Mathematics 33 Diploma examinations. The Mathematics 33 population contains slightly more males than females. About 50.2% of students writing Mathematics 33 diploma examinations were male; 49.8% were female.

What is the overall performance of students on the examinations?

In 1995–96, 79% of the students writing Mathematics 33 attained diploma examination marks at or above the *acceptable standard*. The percentage of students who achieved the *standard of excellence* was 19.1%. During the 1996 administration, 21% of the students did not achieve the *acceptable standard*.

About 15% of the students who wrote the Mathematics 33 diploma examinations were either challenging or rewriting the examination. Regular non-mature students scored an average of 63.5%, whereas regular non-mature students who rewrote the examination (school mark brought forward) scored an average of 52.4%. Mature students who were challenging the examination scored an average of 56.2% (see Table 4-17).

Standards for the Mathematics 33 diploma examinations for the 1995–96 school year were published in the *Mathematics 33 Diploma Examination Information Bulletin*. The emphases on problem solving, communication skills, and applying basic and higher-order skills in the Mathematics 33 curriculum were incorporated into the examination. Students were expected to apply mathematics, describe mathematical situations, explain their solutions, write directions, explain their reasoning, create new strategies, analyze and generalize a mathematics situation, and formulate inferences or hypotheses. For the most part, students did well in many of these categories. The Mathematics 33 examiners' reports outline student success on both machine-scored and written-response questions related to these expectations.

Acceptable Standard

Students who achieved the *acceptable standard* of performance but not the *standard of excellence* (59.9%) were able to solve problems, written in both a pure or applied context, involving either conceptual or procedural understanding, and limited to one problem-solving algorithm at a time.

For example, these students could analyze a quadratic function or the graph of a quadratic function presented in the context of a trajectory, and determine vertex, maximum height, horizontal distance, and axis of symmetry.

Students who did not achieve the *acceptable standard* of performance on the Mathematics 33 Diploma Examination (21%) had difficulty solving problems that require the simple application of conceptual and procedural understandings. Typically, they could not solve problems that require understanding of simple concepts or procedures.

Standard of Excellence

Students who achieved the *standard of excellence* in Mathematics 33 (19.1%) had little difficulty solving any problems, regardless of the conceptual, procedural, and problem-solving understandings required. These students were able to do multistep tasks, and also were able to demonstrate higher order skills, such as logical analysis and making valid inferences in the written-response component of the examination.

Typically students who achieved the *standard of excellence* were able to solve problems that required them to analyze, draw inferences, or generalize from data, equations, graphs, and situations that were presented in either a pure or applied context. Further, they recognized and were able to describe relationships between the specific and general mathematical concepts related to the problem being solved.

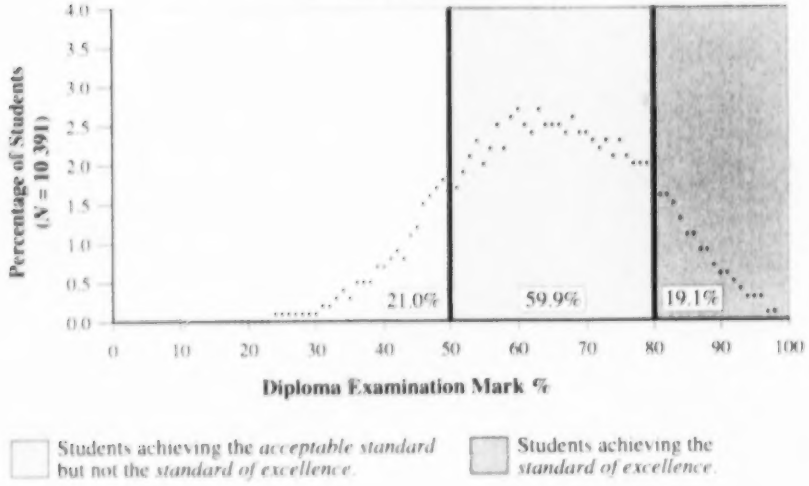
Do the population and performance data reveal any significant trends?

As this was the first year the Mathematics 33 diploma examination was administered, it is too early to identify any trends. However, the students writing the Mathematics 33 diploma examination in 1995–96 have set a benchmark that shows that Mathematics 33 students are able to meet the expectations of the educators and partners involved in setting the first diploma examination in this subject area. Further, students at the *acceptable standard* and the *standard of excellence* were able to demonstrate the standard set, and appeared to be mathematically prepared for their post-secondary opportunities. In demonstrating the standard, they were able to apply mathematical understandings to new situations and problems related to real-life scenarios.

The new format of presenting questions in a scenario and mixing them as to curriculum fit and question type did not pose a problem for Mathematics 33 students. This format has been strongly endorsed by the various stakeholders involved in developing and scoring the new examination.

Figure 7-6

Mathematics 33
Distribution of Diploma Examination Marks
1995–96 School Year



Biology 30

What are the characteristics of the student population that wrote the examinations?

In 1995–96, 17 225 students with corresponding school-awarded marks wrote the Biology 30 diploma examinations. This represents a slight increase of 1.7% compared with 1994–95; likely, the biology student population is stabilizing at around 17 000 students per year. The writing population represents more than one-half of the students who wrote either the English 30 or English 33 diploma examinations.

Students who take Biology 30 are more likely to take English 30 than English 33. Also, they are more likely to take Math 30 and Social Studies 30 than Math 33 and Social Studies 33, respectively. This means that biology students' achievement in these 30-level courses tends to be higher than the means achieved by all students taking English 30, Math 30, and Social Studies 30.

Approximately 66% of the Biology 30 population in 1995–96 completed four or more diploma examination courses. Compared with Chemistry 30 and Physics 30, Biology 30 has a lower proportion of students who write four or more diploma examinations during a school year. Notwithstanding, Biology 30 is primarily intended for students intending to pursue post-secondary studies. Of science courses, 49% of the Biology 30 population completed only one diploma examination, 36% completed two, 15% completed three, and two students completed all four science diploma examinations.

The Biology 30 population has more females than males. About 58% of students writing Biology 30 Diploma Examinations are female; 42% are male.

What is the overall performance of students on the examinations?

The overall performance of students who wrote the Biology 30 diploma examinations during the 1995–96 school year was slightly lower than the previous year. This is reflected in the examination average (62.6%) and in the proportion of students (77.0%) who achieved the *acceptable standard*. An acceptable proportion of students (18.1%) achieved the *standard of excellence*. Although 22.9% of the students did not meet the *acceptable standard*, 8.4% of all students obtained marks ranging from 45% through 49%. Most of these students would be able to achieve the *acceptable standard* on future diploma examinations in Biology 30 if they received additional instruction.

The percentage of female and male students who achieved the *acceptable standard* on the Biology 30 diploma examinations was almost the same—76.9% for females and 77.3% for males. The percentage of females who achieved the *standard of excellence* on the Biology 30 diploma examinations was 17.4, compared with 19.2 of males. The Biology 30 diploma examinations average for females and males was the almost the same—62.8% for females and 63.0% for males (see Table 3-2).

As in the previous four years, the group that attained the highest examination average (see Table 7-7) wrote Biology 30 diploma examinations while in their second year of high school. This group likely contains a high proportion of students who plan to take additional 30-level science courses in their third year of high school.

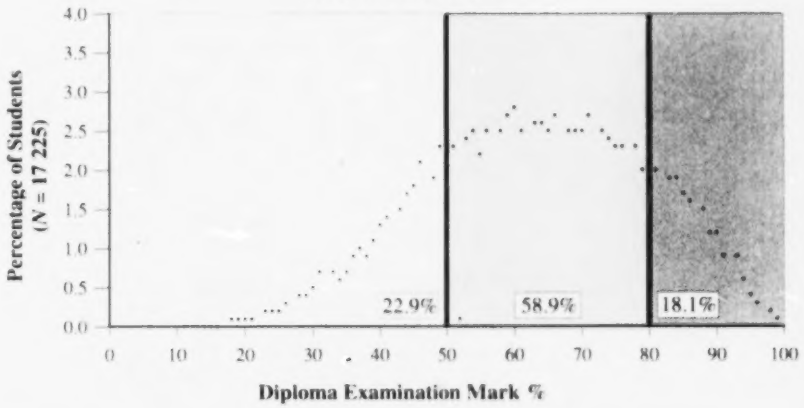
Acceptable Standard

Students who achieved the *acceptable standard* but not the standard of excellence (58.9% of the population) understood most of the basic functions of population interactions and genetics, reproductive systems, differentiation, and development. Biological concepts such as cell division and Mendelian and molecular genetics proved difficult. They recalled some properties of key biological substances (hormones), and therefore selected correct physiological functions for these substances.

This group of students correctly interpreted data presented in simple graphs, tables, and diagrams. However, they found it difficult to interpret complex graphs and tables that presented interrelated sets of data.

Figure 7-7

Biology 30
Distribution of Diploma Examination Marks
1995–96 School Year



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They related biology concepts to simple human experiences but found it difficult to analyze multistep problems in molecular and population genetics. Questions that required the understanding of biology concepts within the context of technology (how technology extended knowledge of cells or components of cells) proved difficult. The basic language of biology was understood by these students, but specialized terms that incorporate sophisticated science concepts (negative feedback, genetic engineering, reabsorption, hypothesis) created problems for them. They composed one- or two-sentence answers that were clear and logical for questions that contained only one component. However, they had difficulty creating multistep, paragraph responses to problems that required the development of several ideas. Their answers to these questions frequently consisted of recalled information that did not address the central issues of the problems posed. These students did not clearly express cause-and-effect relationships.

Students who failed to achieve the *acceptable standard* (22.9% of the population) did not understand basic functions of the nervous, endocrine, and reproductive structures. With the exception of population interactions, all biological concepts proved too difficult. They found it difficult to interpret data represented in diagrams and tables. They did not know the functional properties of key biological substances. They were unable to make predictions based on simple principles of inheritance and to sequentially organize the major steps of physiological processes. This group of students could not compose clear and logical explanations for single-component problems. Their responses indicated that they did not adequately understand the meaning of the questions.

Standard of Excellence

Students who attained the *standard of excellence* (18.1% of the population) demonstrated consistent performance throughout the examination, whether they selected or created responses. They could recall precise knowledge about the structure and function of human organs, the mechanisms of inheritance, and populations. They could then use this knowledge to solve multistep problems. They were able to understand the chemical and neural pathways of communications, to understand all aspects of reproduction and genetics, and to arrange physiological processes in sequential order. They could perform calculations in molecular genetics and in population genetics and dynamics. They could form hypotheses based on initial data and then evaluate them in the light of new data. They could evaluate experimental designs and explain why the results could or could not be used to support certain decisions. Their compositions demonstrated a clear understanding of cause-and-effect relationships. They used scientific vocabulary with precision, and communicated clearly.

Do the population and performance data reveal any significant trends?

From the 1992–93 to the 1995–96 school years, the total number of students who obtained a final course mark in Biology 30 decreased from 21 926 to 17 094, and in all population subgroups. The number of Grade 11 (2nd year of high school) students showed a large decrease in 1993–94, from 2 243 to 785, because of the implementation of the new Biology 20 course. Since the former Biology 30 course was not congruous with the new Biology 20 course, the majority of Grade 11 students waited until their Grade 12 year to enroll in Biology 30, thus causing a change in population size. In 1995–96, the number of Grade 11 students increased to 1 818; while this still represents a decrease in numbers from 1992–93, the proportion

Table 7-7

Biology 30 Diploma Examination
Five-Year Comparison by Population Percentage and Achievement Averages

Year	Subgroup	Grade 11 Students	Grade 12 Students	Atypical Exam Writers*	Transferred in From Outside the Province
1995–96	Percentage of Population	10.7	82.1	3.8	3.4
	Examination Average	66.8	62.6	54.2	60.0
1994–95	Percentage of Population	7.9	83.8	4.5	3.8
	Examination Average	72.6	65.2	55.6	63.4
1993–94	Percentage of Population	4.3	84.4	7.1	4.2
	Examination Average	71.1	65.3	59.0	65.5
1992–93	Percentage of Population	10.2	79.5	6.3	4.0
	Examination Average	69.4	64.6	59.4	64.3
1991–92	Percentage of Population	11.2	78.8	5.7	4.3
	Examination Average	67.5	62.6	56.6	63.3

*This group includes repeaters, individuals challenging the examinations, and students without a school-awarded mark.

Table 7-8

Biology 30
Five-Year Comparison of Selected Population and Achievement Indicators

	1991–92	1992–93	1993–94	1994–95	1995–96
Number of Students	20 313	21 604	17 943	16 941	17 225
Female/Male Proportions (%)	58/42	58/42	58/42	59/41	58/42
Students Achieving *Acceptable Standard* on Diploma Exam (%)	76.5	81.6	81.4	80.9	77.0
Students Achieving *Standard of Excellence* on Diploma Exam (%)	20.5	22.1	23.2	24.2	18.1

(10.7%) is the same as it was in 1992–93 (10.2%).

The percentage of the population of each subgroup shows some changes as well. Over the five-year period, the proportion of Grade 12 (3rd year of high school) students appears to be slightly increasing, whereas that of Grade 12 (4th year of high school) and of transferred-in students appears to be decreasing (see Table 7-7).

From 1991–92 through 1995–96, the created-response section of the Biology 30 examinations changed in that increasing emphasis was placed on solving problems that were set in authentic science research contexts. Students were expected to solve these problems by using scientific process skills and by relating their understanding of science concepts to technological and societal issues. In keeping with these changes, the individual items were reduced in number (from 7 to 2), but each item was increased in its breadth. The diploma examinations as a whole still remained accessible to the group of students who achieve at the *acceptable standard* as well as to those students who achieve at the *standard of excellence*.

Although the percentages of students achieving the *acceptable standard* and those achieving the *standard of excellence* have increased since 1991–92, in 1995–96 the percentage in both of these categories returned to pre-1992–93 values. The 1995–96 percentages in both categories are now more similar to those in other subjects such as Chemistry 30 and English 30.

The proportion of females and males who obtain Biology 30 diploma examination marks has changed very little during the past four school years. However, the proportion of females who achieved the *acceptable standard* in Biology 30 from 1991–92 to 1995–96 increased by approximately 2.4%, while the proportion of males who achieved the *acceptable standard* for this same period decreased by 2.3%.

Chemistry 30

What are the characteristics of the student population that wrote the examinations?

In the 1995–96 school year, 578 more students (15 247) with corresponding school-awarded marks wrote the Chemistry 30 diploma examinations than in 1994–95 (14 669). The proportion of the writing population for chemistry relative to the population of students who wrote either the English 30 or English 33 diploma examinations increased from 42.3% in 1994–95 to 46.2% in 1995–96. A potential explanation may be that students who previously did not take chemistry but were capable of achieving the *acceptable standard* or the *standard of excellence* are beginning to enroll in chemistry.

What is the overall performance of students on the examinations?

The overall performance of students who wrote the Chemistry 30 diploma examinations during the 1995–96 school year was satisfactory (see Figure 7-8). In 1995–96, 81.6% of the students writing Chemistry 30 attained diploma examination marks at or above the *acceptable standard*, which is down slightly from 84.0% in 1994–95. Care should be taken when making these comparisons since this is only the second year of the revised program. A significant proportion of the students, 18.1%, attained diploma examination marks at or above the *standard of excellence* (see Figure 7-8). This percentage is lower than the 20.2% of the students who achieved the *standard of excellence* in 1994–95. Once again, caution should be exercised in drawing conclusions from these figures. As in previous years, many of the students (8.2%) attained marks ranging from 44% to 49%.

These students could achieve the *acceptable standard* with further instruction.

The percentage of female students who achieved the *acceptable standard* on the Chemistry 30 diploma examination was 79.6%, compared with 83.6% of male students. The percentage of females who achieved the *standard of excellence* on the examinations was 16.0%, compared with 20.3% of male students. The average for females on the Chemistry 30 examinations was 63.0%, compared with 65.4% for males. These differences may be explained, in part, by the attractiveness to males of the technological emphasis in the new course.

Acceptable Standard

Students who achieved the *acceptable standard* but not the *standard of excellence* (63.5% of the population) were able to do stoichiometry of more than one step as long as it did not involve writing and balancing equations for chemical reactions. They were able to calculate the amount of energy required to warm a given mass of water; the concentration of an acid, given the concentration and volume of the titrant; and the volume of acid, provided that the ratio between the sample and titrant was 1:1. They were able to assign oxidation numbers to most atoms and were capable of balancing chemical reactions using half-reactions. These students could transpose data to and from graphical form and had a good grasp of essential definitions and terms such as conjugate base, Arrhenius acid, pH, and exothermic–endothermic. They had little if any difficulty in adapting to the new soft-linked question formats presented to them on the 1996 series of diploma examinations. They successfully ranked species on the basis of their properties, ranked reactions on the basis of the magnitude of the energy involved, and were able to use and extract pertinent information from the data booklet. However, they had difficulty recognizing ratios other than 1:1 in acid–base chemistry, solving any calculation-based equilibrium problem, and solving complex stoichiometric problems. They usually recognized the correctness of a situation for most concepts, but had difficulty applying these concepts in unfamiliar contexts. They were weak in relating concepts to real-world circumstances. These students were usually able to organize their creative responses in an understandable fashion, though they had difficulty with communication conventions, such as spelling, significant digits, and, especially, SI prefixes.

These individuals worked best at the macroscopic level and, as a result, did well on the multiple-choice questions.

Students who did not achieve the *acceptable standard* of performance on the Chemistry 30 Diploma Examination (18.4%) had difficulty in solving stoichiometric problems other than those involving single-step addition/subtraction problems, such as calculating the voltage of a cell given

Figure 7-8

Chemistry 30
Distribution of Diploma Examination Marks
1995–96 School Year

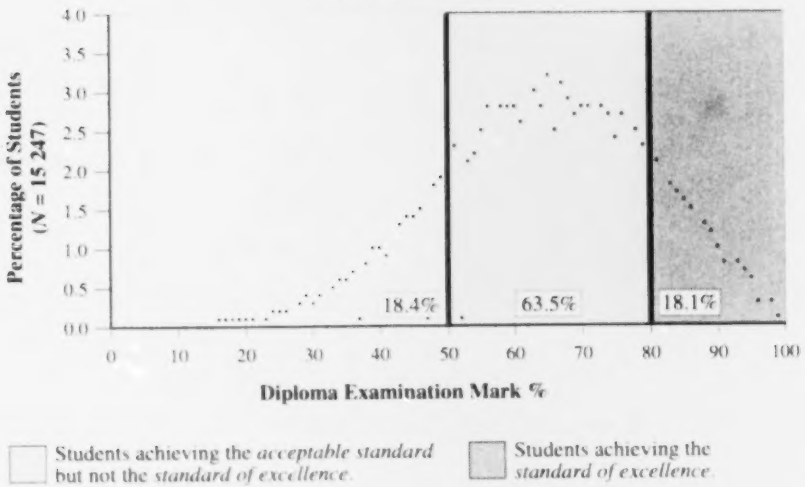


Table 7-9

Chemistry 30
Five-Year Comparison of Selected Population and Achievement Indicators

	1991–92	1992–93	1993–94	1994–95	1995–96
Number of Students	16 156	16 865	14 798	14 669	15 247
Male/Female Proportions (%)	48/52	48/52	48/52	48/52	49/51
Students Achieving *Acceptable Standard* on Diploma Examination (%)	83.0	81.6	79.6	84.0	81.6
Students Achieving *Standard of Excellence* on Diploma Examination (%)	22.5	21.1	22.9	20.2	18.1

the half-reactions or determining the hydronium ion concentration given the pH. These students were unable to transfer data to or from graphical form or to use data to predict trends, patterns, or properties. They also had difficulty predicting chemical changes and writing appropriate chemical equations for the changes involved. Nor were they successful in relating their understanding of chemistry into a real-world context. In general, these students had difficulty creating their responses and communicating their ideas clearly. As a result, they did not do well on the created-response (numerical and written) sections of the examination. They did, however, recognize correct statements about essential concepts and had their greatest success on the multiple-choice section of the examination.

Standard of Excellence

Students who achieved the *standard of excellence* (18.1%) were able to solve any stoichiometric problem and to recognize ratios other than 1:1 in acid–base chemistry. They also recognized relationships between the dissolved solute and the resulting species and, as a result, were able to accurately predict physical and chemical properties of solutions. They had no difficulty in distinguishing between strength and concentration, nor did they have difficulty in inferring properties from graphical data. They were able to recognize when a reaction would or would not occur, and thus did not always assume that a reaction is forthcoming when two or more reagents are combined. They did have difficulty in dealing with comparisons based upon logarithmic functions and involving practical applications. They also had difficulty determining K_b and other values that required the use of principles related to equilibrium. In general, they were able to apply their knowledge in new and novel situations and, as a result, were very successful in creating responses. However, they had some difficulty in relating concepts learned in the classroom to real-life applications. The new soft-linked questions did not provide them with any difficulties. As expected, they did well on all sections of the examination.

Do the population and performance data reveal any significant trends?

As expected, the previously identified trend of significant Grade 11 student participation continued this year, reaching the level that existed before the implementation of the revised curriculum. The number of Grade 11 students increased significantly, from 6.3% of the population to 8.5%. The Grade 11 students' achievement in Chemistry 30 continued to be strong, with 21.7% of these students attaining the *standard of excellence* and 64.2% attaining the *acceptable standard* but not the *standard of excellence*. This high success is partially due to the International Baccalaureate Chemistry program, where some students write the Chemistry 30 diploma examinations in the second year of the program (Grade 11). It is expected that the number of Grade 11 students enrolled in Chemistry 30 will remain around 8% in 1996–97.

The achievement of out-of-province students continued to decrease relative to that of Grade 12 students, while the achievement of atypical students did not change relative to the Grade 12 students.

Overall, there was no significant improvement or decline in any curricular area. However, student performance on concepts directly related to equilibrium is not as great as on other concepts of equal challenge. The same is also true of student performance in relating concepts learned in the classroom to real-life situations. These weaknesses may be due, in part, to the newness of the recently revised chemistry curriculum.

Table 7-10

Chemistry 30 Diploma Examination
Five-Year Comparison by Population Percentage and Achievement Averages

Year	Subgroup	Grade 11 Students	Grade 12 Students	Atypical Exam Writers*	Transferred in From Outside the Province
1995–96	Percentage of Population	8.5	85.5	2.2	3.8
	Examination Average	67.0	63.9	56.1	62.9
1994–95	Percentage of Population	6.3	86.4	3.0	4.3
	Examination Average	68.2	65.5	57.6	66.3
1993–94	Percentage of Population	3.5	86.8	4.7	5.0
	Examination Average	70.2	63.4	56.6	65.9
1992–93	Percentage of Population	8.0	82.7	4.4	4.9
	Examination Average	67.8	64.3	57.7	66.1
1991–92	Percentage of Population	8.5	82.5	4.0	5.0
	Examination Average	68.7	64.5	58.1	68.2

*This group includes repeaters, individuals challenging the examination, and students without a school-awarded mark.

Physics 30

What are the characteristics of the student population that wrote the examinations?

In 1995–96, 8 068 students with corresponding school-awarded marks wrote the Physics 30 diploma examinations. The participation rate in Physics 30 consisted of 63.2% male students (5 095) and 36.8% female students (2 973). Compared with 1994–95, the participation rate for males and females has remained relatively constant.

As shown in Figure 2-3, Physics 30 students write, on average, 4.5 different diploma examinations. Only students writing Français 30 take more.

Physics 30 continues to be a course designed for students going on to academic and technological post-secondary physics- and science-related programs. Registration in Physics 30 should continue to be encouraged, as many career opportunities require the knowledge and skills supported by the high school physics program.

What is the overall performance of students on the examinations?

The overall performance of students writing the Physics 30 diploma examinations during the 1995–96 school year was satisfactory (see Figure 7-9). Although actual diploma results were consistent with the performance in previous years (Table 7-11), slightly fewer students achieved the *standard of excellence* than in 1994–95. The proportion of students with diploma examination marks at or above the *standard of excellence* was 25.7%. This represents a decrease of 2.5% from the results in the previous year. The proportion of students that failed to achieve the *acceptable standard* was 20.3%, compared with the previous year's proportion of 16.3%.

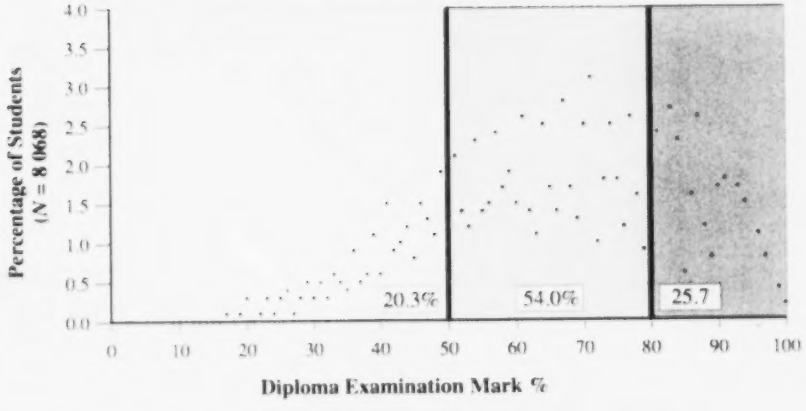
Acceptable Standard

In 1995–96, students who achieved the *acceptable standard* but not the *standard of excellence* (54.0%) could reliably state and solve problems that could be related quickly to an equation in the data booklet. For this group, laboratory skills were limited to using laboratory data to verify known physics information. These students were capable of producing a graph from raw data, calculating quantities such as momentum, energy, voltages, stopping voltages, centripetal force, and distances travelled by electromagnetic waves. They tended to use item-specific methods in their problem solving, and rarely used the major generalizations of physics, such as Newton's laws or those of the conservation of energy or charge. In addition, students had difficulty communicating, for example, their method of solving a problem. Thus, students performing near the *acceptable standard* showed only limited understanding of the full scope of the Physics 30 program of studies. Within this restricted range of content, such students performed well.

In addition, students with final course marks near the *acceptable standard* used the data booklet supplied more as a crutch than as a summary of the physics content. Those who achieved this standard showed that they could use the equations and information provided to solve problems requiring single-step calculations and simple two-step calculations. They were also competent in recalling facts and essential definitions related to specific concepts. Many students found it difficult to translate definitions into alternative forms and to judge whether a data book value was valid within the range of values given in a particular problem. These students had difficulty identifying a relationship between two variables that had been expressed in a graphical representation. Students achieving at this standard found it difficult to make predictions based on information or data presented. They found the multiple-choice section far easier than the written-response section, and typically scored 30% higher on this section of the exam.

Figure 7-9

Physics 30
Distribution of Diploma Examination Marks
1995–96 School Year



Students achieving the *acceptable standard* but not the *standard of excellence*.

Students achieving the *standard of excellence*.

Standard of Excellence

Students achieving the *standard of excellence* (25.7%) showed far more flexibility and creativity than those students achieving the *acceptable standard* but not the *standard of excellence*. They used general methods of solution and were not afraid to use conservation laws to solve unusual problems. They illustrated a transference of knowledge from one area of physics to another and expressed their answers clearly and concisely. They made inferences that were not part of their "known" area of physics. These students were able to use generalizations of physics and to distinguish between vectors and scalars or forces and fields.

In 1995–96, students with final course marks near the *standard of excellence* tended to use the data booklet to support their problem-solving strategies, but were not overly dependent upon it. These students stated and easily recognized relationships between variables. They were able to derive equations as needed, design procedures for a laboratory activity, and communicate effectively the procedures used to arrive at a solution. Those who achieved just below this standard had some difficulty with questions that required multistep solutions, and they needed explicit cues before they were able to use a wider range of problem-solving strategies. In many cases, such students solved more complex problems in the multiple-choice format, but experienced difficulty with similar concepts tested in a written-response format. They were adept at selecting the correct response in the multiple-choice section and in creating their own responses for similar questions in the numerical-response sections. When confronted with a problem requiring the use of two or more steps, they created their own procedures for solving problems. Many of their responses to the written-response questions showed a high level of sophistication.

Do the population and performance data reveal any significant trends?

Based on the actual results of students writing the Physics 30 diploma examinations, achievement has been fairly consistent (Table 7-11). Students continue to do well on the multiple-choice section of the examinations and continue to improve on the numerical-response section. In the written-response section, there continues to be a decrease in the number of students who leave questions blank.

Achievement has shown improvement in some specific areas. Students have shown a marked increase in their ability to solve problems involving routine calculations. They perform well on problems requiring single-step or two-step calculations, but continue to have major difficulties using ratios. A second area of improvement is in the students' ability to deal with questions involving scenarios or technology. Students are beginning to gain confidence in their ability to apply their knowledge of physics to real-life situations. This is especially evident in the open-ended written-response questions. More students are attempting these questions, and there has been a marked improvement in their ability to organize their answers and to clearly communicate their solutions. Students are still somewhat confused between electric and magnetic fields, and in their understanding of the movement of charges when explaining induction and conduction.

Table 7-11

Physics 30
Five-Year Comparison of Selected Population and Achievement Indicators

	1991–92	1992–93	1993–94	1994–95	1995–1996
Number of Students	8 196	8 458	7 488	7 717	8 068
Male/Female Proportions (%)	65/35	64/36	64/36	63/37	63/37
Students Achieving *Acceptable Standard* on Diploma Examination (%)	81.4	81.5	84.8	83.8	79.7
Students Achieving *Standard of Excellence* on Diploma Examination (%)	22.6	26.6	32.3	28.2	25.7

Science 30

What are the characteristics of the student population that wrote the examinations?

In 1995–96, 976 students with corresponding school-awarded marks wrote the Science 30 diploma examinations. There were 1 378 students who received final marks in the 1994–95 implementation year. No diploma examinations were written in the implementation year, so students received a school-awarded mark only. Such a low enrollment is disappointing because the Science 30 course is designed to give a broad science education to students who are intending to pursue post-secondary studies, but not necessarily in a science discipline. Both NAIT and SAIT have recognized the value of promoting science literacy through an integrated science course by making Science 30 a recommended prerequisite for some of their courses. SAIT has expressed interest in using the Science 30 data booklet in some of its entrance examinations. It is hoped that this kind of support and the acceptance of Science 30 by colleges and universities will encourage an increasing enrollment in Science 30 in future years.

The average number of different diploma examinations written by the Science 30 population in 1995–96 was 3.6. This compares with an average of 3.8 different diploma examinations written by all students (see Figure 2-3). Whereas most students who enroll in a science discipline (biology, chemistry, or physics) enroll in one or two additional sciences, only 9.0% of Science 30 students enrolled in another science. Enrolling in Science 30 and a discipline would give students an advantage in both subjects and a rich science experience. Such a combination would also result in a greater number of options for post-secondary study.

The Science 30 population comprises more males than females. About 54.3% of students writing Science 30 Diploma Examinations were male; 45.7% were female.

What is the overall performance of students on the examination?

In 1995–96, 79.3% of the students writing Science 30 attained the *acceptable standard*. Many of the students (11.4%) attained marks ranging from 44% to 49%. When the exam mark was blended with the school mark, 90.2% of the students achieved the *acceptable standard*. The percentage of students who achieved the *standard of excellence* on the Science 30 diploma examinations was 9.8%.

Of the 986 students who wrote the examination, 58 were mature students who also received a school mark. The average of this group was 59.1%. Six mature students challenged the examination and attained an average of 58.8%. The nine regular, non-mature students who rewrote the examination achieved an average of 49.4%.

The percentage of males who achieved the *acceptable standard* was 82.1% compared with 76.0% of female students. The percentage of males who achieved the *standard of excellence* was 10.2% compared with 9.4% of female students. The average for males on the Science 30 examinations was 62.1% compared with 60.1% for females. Although the male population seems to have a slight advantage on the examination, the reverse is true for the school-awarded mark, and the blended mark for males, compared with that for females, is almost identical.

Standards for Science 30 are outlined in detail in the 1994–95 *Science 30 Information Bulletin*, pages 39 to 64. The emphasis on science literacy and communication skills in the Science 30 curriculum were incorporated into the examination. On the examination, students were expected to use a data booklet to solve physics-, chemistry-, and biology-based problems, design and interpret scientific studies, provide risk–benefit analyses for some technologies, and defend a point of view on an issue related to science and society. The Science 30 Bulletin outlines the scoring criteria for these questions.

Acceptable Standard

In 1995–96, students who achieved the *acceptable standard* but not the *standard of excellence* (69.5%) were able to locate the appropriate information in the data booklet and use the information to answer one-step problems. Questions involving Ohm's Law, field strength, frequency, and wave length were answered correctly by these students, but they had difficulty if the questions were embedded in a context. For example, these students would be able to determine the resistance in an electrical circuit, given the amperage and voltage. They would have difficulty, however, if the circuit was presented in diagram format with the values of voltmeters and ammeters given. Many students in this group had difficulty solving titration problems. They knew the general characteristics of fission and fusion reactions, but had difficulty with mass-to-energy calculations. These students generally had a good understanding of the source of pollutants and the risks and benefits associated with various energy sources. When describing a technology and how it works, they tended to give general descriptions that lacked detail and specific examples. These students successfully interpreted simple graphs. They wrote appropriate problems and hypotheses for an experimental design, but their interpretation of scientific studies lacked depth. These students solved one-trait Mendelian crosses, but had difficulty solving problems that included x-linkage.

Students who did not achieve the *acceptable standard* of performance on the Science 30 Diploma Examination (20.7%) had difficulty finding the appropriate information in the data booklet and applying it to solve a problem. They were often unable to differentiate between fission and fusion

reactions. Some of the students in this group identified pollution sources and were able to give some risks and benefits associated with various energy sources. They summarized the data represented by a graph, but presented limited interpretations of graphs or scientific studies. When presenting a problem or hypothesis, they often lacked specificity or did not conform to the idea behind the study. These students recalled facts about the body system, but had difficulty with genetic crosses and feedback mechanisms that regulate bodily functions.

Standard of Excellence

Students who achieved the *standard of excellence* on the Science 30 Diploma Examination (9.8%) had little difficulty solving problems, whether they were presented in a straightforward statement or embedded in a context. The interpretation of electrical circuits presented little difficulty. Many of the students in this group solved titration problems and mass-to-energy conversions, balanced nuclear equations, and applied Hesse's Law to combustion reactions. Genetics and the interrelationships among the body systems were well understood.

Students who achieved the *standard of excellence* were able to critically analyze scientific studies, including the associated charts, graphs, and conclusions. These students were aware of a variety of viewpoints relating to the environmental and ethical issues in the field of science and technology. They clearly expressed their opinions about these issues.

Do the population and performance data reveal any significant trends?

Although 1995–96 was the first year that Science 30 students wrote a diploma examination, some trends are apparent from field test data. Students in the previous year struggled with questions where they had to find information in the data book. Students who wrote the examination in 1995–96 were very successful with this type of question.

Students have shown a steady improvement in communication skills from the first field tests in 1994 to the written-response questions on the June 1996 diploma examinations. The majority of students are now able to ascertain what the question is asking and can present a well-organized answer that contains specific examples to support their opinions.

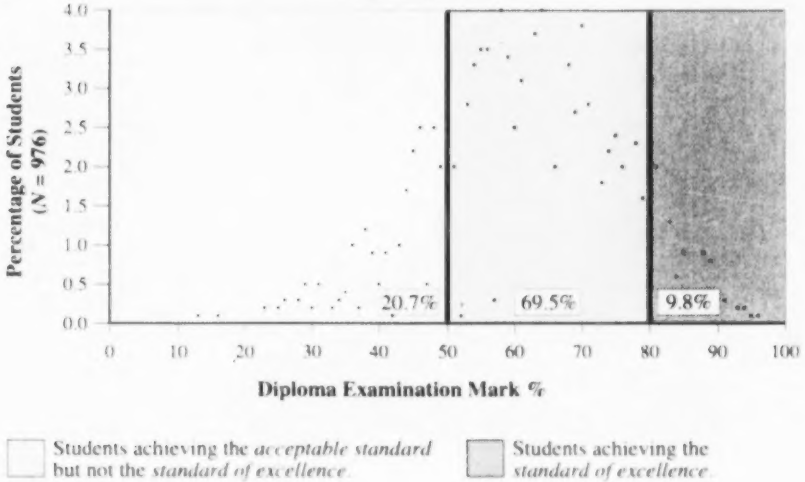
Students continue to experience difficulty in writing about major technologies from the STS component of the course. They also have difficulty with multistep problems, genetic-inheritance calculations, and the interpretation of electrical circuit diagrams.

It is expected that responses to questions that require a student to design or interpret a scientific study will improve as students experience these types of questions in the classroom and on future diploma examinations.

The number of students who completed Science 30 dropped from 1 378 in 1994–95 to 1 018 in 1995–96. At the same time, the number of students who completed Science 20 dropped from 2 087 to 2 074. It is hoped that this trend will reverse in the future, given the high regard that NAIT, SAIT, and other post-secondary institutions have shown for the program.

Figure 7-10

Science 30
Distribution of Diploma Examination Marks
1995–96 School Year



Appendix A

Diploma Examination Development Process

The staff of the Student Evaluation Branch give great care and attention to the development and marking of all diploma examinations to ensure that students' marks on diploma examinations are fair and equitable measures of their achievement.

Professional staff of the Student Evaluation Branch work with many individuals in the complex process of developing diploma examinations. Classroom teachers, school and jurisdiction administrators, representatives from post-secondary institutions, and staff of the Curriculum Standards Branch and Language Services Branch are all involved.

It takes approximately 18 months to complete the development of a diploma examination. The examination development process follows these steps:

- Planning
- Approving Examination Blueprints
- Developing Examination Questions
- Constructing and Administering Field Tests
- Analyzing and Revising Questions
- Constructing the Examinations
- Approving the Examinations
- Printing and Administering the Examinations
- Marking the Examinations
- Analyzing and Reporting the Results

Planning

The first step in the planning phase is to prepare (under direction from the Curriculum Standards Branch) specifications based on the goals and objectives of the curriculum for each subject.

Examination developers in each diploma examination course then prepare an interim examination blueprint. An examination blueprint is an overall plan used to guide the development of an examination. If a diploma examination is undergoing extensive revision because of curricular change, or if a new examination is to be developed, an advisory committee of teachers and subject consultants will contribute to decisions about the emphasis and design of the examination.

As blueprints are drafted and examinations designed, examination developers and advisory committees must address these questions:

- What knowledge and skills can students be expected to possess?
- How can the various parts of the curriculum best be tested?
- What should be the weighting for each part of the curriculum tested?
- How long and how demanding should the examination be?
- What format will produce the most valid results?
- What types of questions will be most valid and reliable? (Multiple choice, short answer, extended written response?)
- How should the examination be organized to produce valid and reliable results?
- How will students' responses be scored? What will the criteria be for scoring?
- How should the results be reported?
- Who will receive the results?

To ensure that each examination is a fair and equitable measure of students' accomplishments in the course, and to ensure that results will be meaningful and reliable, examination developers incorporate curricular as well as statistical standards into the examination design.

Examination questions are developed to reflect the range of expectations for students' achievement that is embedded in the curriculum. Each question is classified and cross-referenced to the curriculum in terms of the specified knowledge, skills, and understanding the question is designed to assess. The range of difficulty embedded in the curriculum dictates the range of difficulty of examination questions.

Field testing confirms and validates the curricular expectations as reflected by the questions. Item analysis of the machine-scorable field-tested questions provides technical data about the relative difficulty of questions and about the technical strength of sets of questions. Field-tested questions are kept for use on a diploma examination or are re-field tested to ensure that they meet appropriate technical and curricular standards, or such questions are discarded.

Approving Examination Blueprints

When examination developers and their advisory committees have developed an examination design and blueprint,

including criteria for scoring written responses, a committee of Alberta Education staff (Regional Offices of Alberta Education, the Curriculum Standards Branch, Language Services Branch, and the Student Evaluation Branch) review the proposed design. The blueprint and design the committee recommends is then reviewed by an Examination Advisory Committee consisting of representatives nominated by the Alberta Teachers' Association, the Conference of Alberta School Superintendents, the Universities Co-ordinating Council, the Public Colleges of Alberta, Alberta Education, and representatives from business, industry, and other professional organizations and non-government agencies. This committee makes recommendations regarding the final examination design to the Director of the Student Evaluation Branch.

Developing Examination Questions

Following approval of the examination design, format, and blueprints, examination developers plan for question development. On the recommendations of superintendents, classroom teachers from across the province are selected to work on question development committees chaired by examination developers from the Student Evaluation Branch.

Professional examination development staff of the Student Evaluation Branch ensure that teachers serving on question development committees understand the technical principles of question construction. The teacher committees develop questions that meet the curricular and technical standards incorporated in the examination design and blueprints, and that will fairly test the skills and concepts that students can be expected to have acquired.

Questions developed in committee are then carefully screened, edited, and revised so that all blueprint requirements and technical standards are met. At this point, copyright approval is sought for testing materials such as literary selections, cartoons, graphs, maps, charts, and data sets.

Constructing and Administering Field Tests

Examination developers at the Student Evaluation Branch construct field tests containing questions developed by the teacher committees. Each field test is carefully edited and revised to ensure technical and curricular validity, and faithfulness to the examination blueprint. School jurisdiction personnel grant permission for the administration of field tests to students in their systems in January and/or June of each school year.

Based on the geographic and demographic variables expected for the total population that will write a given diploma examination, the Student Evaluation Branch field-testing administration staff selects a minimum sample of 250 students to write each field test. Field tests are administered only to students who are nearing completion of the diploma examination subject being tested so that their performances on the field test will be predictive of the performances of students writing the diploma examination.

Student Evaluation Branch professional staff members administer the field tests under secured examination conditions. This procedure allows examination developers to receive first-hand information from teachers and students about examination questions and formats. As well, the procedure ensures test security and uniform administration conditions so that statistical results can be considered reliable.

Teachers whose classes participate in field testing comment on:

- level of difficulty of questions
- curricular validity
- appropriateness of questions, data sets, reading selections, format
- problems with questions, stimulus material, art work
- clarity of instructions
- correspondence between questions and the way in which a concept is taught

Students are also encouraged to discuss the field test with the field test administrator.

All of the data from field testing—statistical and anecdotal—provide the examination developer with accurate and first-hand information that is used to ensure that the final form of each diploma examination is a valid and reliable measure of students' achievement.

Analyzing and Revising Questions

Examination developers carefully analyze the statistical results and teacher comments for each field test to determine the need for additional field testing. Individual questions or question sets requiring changes are revised and submitted for further field testing. If changes are not feasible, questions are discarded.

Questions and question sets that prove successful in field testing are considered for inclusion in a diploma examination.

Constructing the Examinations

The diploma examinations are composed of questions and/or question sets that have proven to be valid in field testing. For each diploma subject, parallel examinations are developed annually for administration in January, June, and August. Additional administrations are also scheduled depending upon need and resources. The examinations are designed to be parallel in form and equivalent in difficulty. Each examination is constructed according to the approved blueprint (i.e., each will have approximately the same number of questions testing a particular facet of the curriculum as specified by the blueprint). An information bulletin outlining the design, format, and marking criteria for each diploma examination subject is distributed to schools at the beginning of each school year. The

information bulletins include changes from previous years' examinations and scoring guides.

Approving the Examinations

Once a final form of a diploma examination is drafted, it receives editing, proofreading, and technical checking. The examination developers from the Student Evaluation Branch present the final form of each examination to an Alberta Education committee that gives the examination a thorough technical review.

The recommendations of the Alberta Education committee are incorporated into any additional revisions that are necessary.

The Examination Advisory Committee also meets each administration to review the results of the past year's examinations and to advise on policy issues that affect the design, development, and administration of the examinations and the reporting and interpretation of the results.

Printing and Administering the Examinations

Following the Director's approval of the final form of a diploma examination, examination developers ensure completion of additional quality checks that include editing, proofreading, validating of correct answers by a teacher committee, checking print quality of art work and illustrations, confirming precise match to the blueprint, and completing a final estimate of difficulty for each question.

Each examination is printed and then distributed to schools just before the administration dates.

Schools are responsible for ensuring the security of examinations before administration and for ensuring that examinations are administered according to regulations. Each school receives extra copies of the January and June examinations for use in the school.

Diploma examinations are scheduled annually in January, June, and August, and are conducted according to examination regulations. Additional administrations of examinations in selected courses are also scheduled. Schedules and regulations are published in the *General Information Bulletin* that is distributed to schools each fall.

The August examinations and additional examinations are confidential and therefore remain secured.

Students identified as having learning and/or physical disabilities may apply for special provisions for examination writing. Special provisions include brailled examinations, large-print examinations, tape-recorded examinations, additional writing time, use of a word processor, use of a tape recorder for responses, and use of a sign-language translator. The complete policy for special provisions is printed in the *General Information Bulletin* and is available on request from the Student Evaluation Branch (telephone 403-427-0010). Following administration, completed examinations are shipped (in accordance with security regulations) to Alberta Education in Edmonton for processing and marking.

Marking the Examinations

Markers for the written-response parts of the examinations are teachers nominated by their superintendents and selected on a proportional basis so that the percentage of markers selected from a geographic area is comparable to the percentage of papers from that area. To be selected for marking, a teacher must be currently teaching the subject he or she wishes to mark, must have taught the course for at least two years, and must possess a valid Alberta Permanent Professional teaching certificate.

Selected classroom teachers are trained in the marking procedures and are supervised during the marking session by the professional staff from the Student Evaluation Branch.

The written-response parts of the diploma examinations are all marked centrally. All student and school identification is removed from the papers before the marking so that markers have no means of knowing the source of a paper. Multiple-choice responses are computer-scored.

Analyzing and Reporting the Results

The statistical results of each examination are carefully analyzed. The Examination Advisory Committee may be asked to review the results as well. Reports of local results in each subject are prepared for all school jurisdictions.

Individual student results are mailed about one month after the date on which the examinations were administered. Students who are dissatisfied with their results in any subject may request that their examination in that subject be rescored. The fee for rescoring, including GST, is $26.75 per examination. The mark awarded after the rescoring supersedes the initial mark.

For more information, call the Assistant Director of Examination Development for Language Arts and Social Studies or the Assistant Director of Examination Development for Mathematics and Sciences at 403-427-0010.

Appendix B

Guidelines for Interpreting and Using the Results of the Diploma Examinations

Purpose of the Reports

The jurisdiction and school reports describe the results achieved by students who wrote diploma examinations in this administration and who had a school-awarded mark. If requested by the superintendent, similar reports for instructional groups in the school are also provided. The figures reported do not reflect the results of appeals of school-awarded marks, rereads of diploma examinations, or special cases considerations.

Alberta Education, school authorities, and schools are responsible for ensuring that the highest possible quality of education is provided for students. The results from provincial assessments allow the government, provincial officials, school board members, superintendents, principals, teachers, school councils, parents, and community members to examine results in relation to provincial goals and standards. Results from diploma examinations provide information that can help identify areas of strength, areas needing improvement, and the progress being made toward the achievement of goals. The careful interpretation of results from diploma examinations informs decisions about how to improve student learning.

As noted in the *Guide for Developing School Board Three-Year Education Plans and Annual Education Results Reports*, reporting on the results achieved is one of the keys to establishing processes that lead to continuous improvements to education.

Diploma examination results provide only part of the overall picture of the performance of the province, a school jurisdiction, or a school. Although provincial assessments are designed to assess the achievement of provincial standards as reflected in the Program of Studies, many important learning outcomes cannot be measured by time-limited, paper-and-pencil tests. In addition, many factors contribute to student achievement. The analysis, interpretation, use, and communication of results from diploma examinations need to take these factors into account.

The school and jurisdiction are in the best position to accurately interpret, use, and communicate diploma examination results as they pertain to the school or jurisdiction. Wherever possible, information about a school's or jurisdiction's results should be obtained from the school or jurisdiction.

Considerations

1. Each school authority, in collaboration with its community, is expected to use the results from diploma examinations for its jurisdiction together with data from other performance measures to plan improvements in performance of the school jurisdiction. The school authority is expected to report annually to the parents and taxpayers in the jurisdiction the results for the jurisdiction on provincial assessments. (See *Guide for Developing School Board Three-Year Education Plans and Annual Education Results Reports* for complete requirements for planning and reporting.)

2. The school principal and teachers, in collaboration with parents and the community, are expected to use their school results on diploma examinations together with data from other performance measures to plan improvements in the performance of the students. They are expected to report annually to the parents of students in the school, the school council, and taxpayers in the school's community the school's results on provincial assessments.

3. Results on provincial assessments for individual students and for groups of students of fewer than five shall not be publicly released. Although parents, community members, and taxpayers have the right to know how well schools, school jurisdictions, and the province are performing, the right to privacy of the individual student must be ensured. When there are few students writing a diploma examination at one administration, consideration should be given to reporting annual results only. Annual results, together with results for the last four years, are provided by Alberta Education.

4. Results from provincial assessments can assist teachers in their assessment of their own instructional practice and can assist others in the review of a teacher's instructional practice; however, results from provincial assessments shall not be used as the sole basis for evaluating teacher performance. The performance of students on provincial assessments is the result of several years in school, as well as that of other variables, and cannot be solely attributed to one teacher.

5. School jurisdiction and school results on provincial assessments should be communicated together with provincial results and standards, all of the other measures that provide indications of a school's or a jurisdiction's performance, local targets, the contexts for learning, and plans for improvement.

6. When comparisons are made against provincial standards and results, interpretations should take into account local targets, contexts, and plans.

7. Interpreting and communicating the results for small groups of students should be done with the awareness that the trends for small groups of students can be greatly influenced by the scores of one or two students. Instructional Group Reports for fewer than five students are not provided.

8. The analysis, interpretation, use, and communication of results on diploma examinations should consider the limitations of provincial assessments and adhere to the *Principles for Fair Student Assessment Practices for Education in Canada*.

9. School-awarded marks and diploma examination marks are complementary measures. School-awarded marks should reflect all aspects of learning in a course, including those that cannot be measured by time-limited, paper-and-pencil tests. Although differences can be expected between a student's school-awarded mark and that student's diploma examination mark in a course, large differences between school-awarded marks and diploma examination results for groups of students should be investigated. Final course mark distributions cannot be directly compared to school-awarded mark distributions or to diploma examination mark distributions, as the final mark is not independent of the other two marks.

10. Factors affecting student selection of diploma examination courses vary from school to school. These factors should be considered when comparing school or jurisdiction results with provincial results. The participation rates provided annually as part of the annual roll-up report should be used when interpreting or communicating the diploma examination results.

11. Some information about changes in student performance on diploma examinations from year to year can be derived by comparing the local percentage of students achieving standards to the provincial results in each of the years of interest. Direct comparison of percentages of students meeting standards or averages for a school or jurisdiction from year to year does not provide reliable information on changes in student performance. Changes in curriculum and standards over time affect the results. The diploma examinations are designed to be parallel in a given year but not necessarily across years.

School Factors That Affect Student Achievement

Research in education has identified key aspects of school effectiveness that affect student achievement.

1. **Productive School Climate and Culture**
   - There is a shared and articulated focus on achievement.
   - There is a shared belief that all students can achieve.
   - Staff is cohesive, collaborates, and makes decisions by consensus.

2. **Focus on Student Acquisition of Central Learning Skills**
   - Teachers know what students are to learn and emphasize mastery of key concepts.
   - Students know what is expected of them.
   - Learning time is maximized.

3. **Appropriate Monitoring of Student Progress**
   - Student progress is monitored, reported, and used for planning improvements.
   - Students can show what they have learned.
   - Parents know what their child has achieved.

4. **Outstanding Leadership**
   - Effective instructional leadership is provided.

5. **Parent Involvement**
   - High levels of school and home cooperation are evident.

6. **Effective Instruction**
   - Grouping and organizational arrangements are appropriate.
   - Pacing is appropriate.
   - Curriculum and learning are aligned.
   - Teachers use a variety of strategies.
   - Students are actively involved.

7. **High Expectations and Requirements for Students**
   - Students are held responsible for learning.
   - Higher-order learning is emphasized.

Many other factors can be considered in interpreting results and planning for improved learning. These include students' abilities, attitudes, motivations, aspirations, academic backgrounds, and learning styles. They also include students' family circumstances, socio-economic backgrounds, and community environments.

A Systematic Approach for the Effective Use of Diploma Examination Results

The interpretation and analysis of diploma examinations should be a collaborative effort that can involve teachers, students, parents, and the community. A systematic use of diploma examination results might include the following steps:

1. Comparing test results for a school or instructional group with the provincial results. Be sure that your comparisons include the
   - total test score
   - total on machine-scored and written-response questions
   - subscale scores for machine-scored and written-response questions
   - individual machine-scored and written-response question results
   - differences between school-awarded and diploma examination marks
   - participation rates in each course

2. Noting any patterns, anomalies, and/or interrelationships in the results

3. Hypothesizing relationships between your observations and the factors that have an effect on achievement

4. Developing and implementing a plan to improve the quality of education for students

5. Developing and implementing a communication plan to share results and what the school is planning to do to improve student learning

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Use and Reporting of Results on Provincial Assessments, Alberta Education Policy 2.2.3

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Levine, D. U. & Lezotte, L. W. *Unusually Effective Schools* (1990). National Center for Effective Schools Research & Development, Madison, WI.

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August 2, 1996

Appendix C

Percentage Distribution of Marks in Diploma Examination Courses

Diploma Examination Course	School-Awarded Mark	Diploma Examination Mark	January 1996* Final Course Mark	*January 1995 Final Course Mark*
ENGLISH 30			***N* = 8 855**	***N* = 10 147**
A (80-100%)	18.2	14.1	**13.9**	11.2
B (65-79%)	43.0	40.1	**44.9**	40.0
C (50-64%)	32.8	36.8	**37.8**	42.8
F (0-49%)	6.0	9.0	**3.4**	6.0
Mean	67.4	65.8	**67.1**	65.1
Standard Deviation	12.3	12.5	**11.1**	11.4
ENGLISH 33			***N* = 5 033**	***N* = 5 179**
A (80-100%)	6.2	6.1	**4.2**	3.2
B (65-79%)	35.2	37.4	**36.7**	36.8
C (50-64%)	45.3	40.7	**51.2**	53.4
F (0-49%)	13.3	15.8	**7.9**	6.6
Mean	61.2	62.0	**62.2**	62.0
Standard Deviation	12.0	12.1	**10.2**	9.5
FRANÇAIS 30*			***N* = 19**	***N* = 8**
A (80-100%)	n/a	n/a	**n/a**	n/a
B (65-79%)	n/a	n/a	**n/a**	n/a
C (50-64%)	n/a	n/a	**n/a**	n/a
F (0-49%)	n/a	n/a	**n/a**	n/a
Mean	n/a	n/a	**n/a**	n/a
Standard Deviation	n/a	n/a	**n/a**	n/a
SOCIAL STUDIES 30			***N* = 8 501**	***N* = 8 398**
A (80-100%)	19.8	16.2	**16.9**	15.4
B (65-79%)	41.0	35.8	**39.3**	38.5
C (50-64%)	34.6	32.4	**37.5**	39.4
F (0-49%)	4.6	15.6	**6.3**	6.7
Mean	68.0	64.7	**66.7**	65.9
Standard Deviation	11.9	14.3	**12.3**	12.4
SOCIAL STUDIES 33			***N* = 5 005**	***N* = n/a**
A (80-100%)	5.0	7.1	**3.7**	n/a
B (65-79%)	30.5	35.5	**34.1**	n/a
C (50-64%)	50.3	38.6	**51.7**	n/a
F (0-49%)	14.2	18.8	**10.5**	n/a
Mean	60.0	61.2	**61.0**	n/a
Standard Deviation	11.5	13.0	**10.6**	n/a

** The figures may change slightly as a result of appeals of school-awarded marks, rereads of diploma examinations, or special cases considerations.*

** The January 1996 results for Français 30 are not reported because only 19 students received final course marks.*

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January 1996*

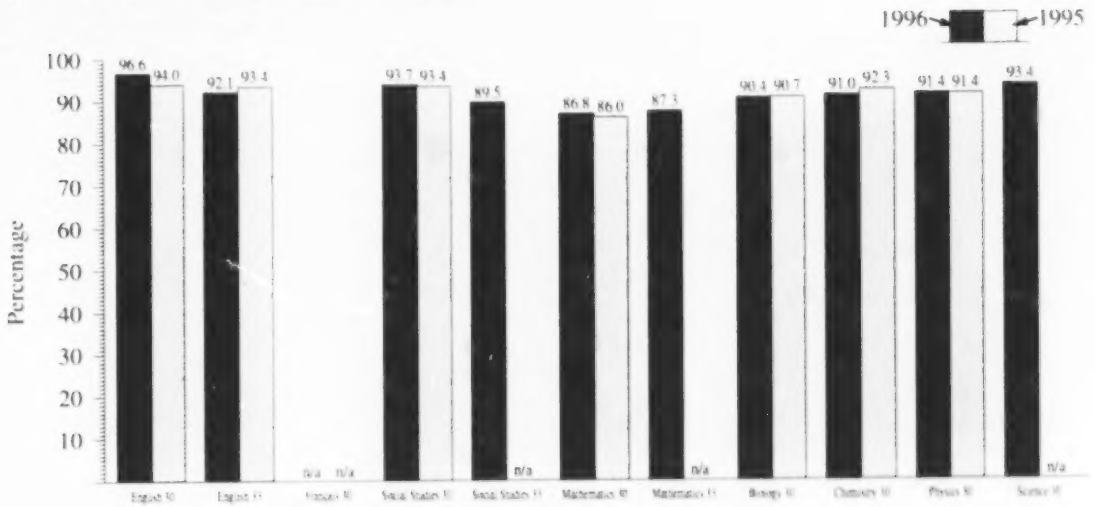
Diploma Examination Course	School-Awarded Mark	Diploma Examination Mark	Final Course Mark	*January 1995 Final Course Mark*
MATHEMATICS 30			**N = 9 614**	**N = 10 420**
A (80-100%)	25.5	18.6	**20.7**	17.6
B (65-79%)	34.9	25.9	**31.2**	31.6
C (50-64%)	31.1	28.8	**34.9**	36.8
F (0-49%)	8.5	26.7	**13.2**	14.0
Mean	68.4	61.6	**65.4**	64.3
Standard Deviation	14.2	18.1	**15.3**	14.8
MATHEMATICS 33			**N = 4 786**	**N = n/a**
A (80-100%)	11.9	20.0	**13.6**	n/a
B (65-79%)	32.6	31.4	**35.3**	n/a
C (50-64%)	38.4	30.3	**38.4**	n/a
F (0-49%)	17.1	18.3	**12.7**	n/a
Mean	62.0	64.5	**63.8**	n/a
Standard Deviation	14.0	16.0	**13.7**	n/a
BIOLOGY 30			**N = 7 670**	**N = 7 762**
A (80-100%)	23.3	17.2	**18.9**	19.9
B (65-79%)	37.9	30.7	**34.6**	35.6
C (50-64%)	31.7	30.5	**36.9**	35.2
F (0-49%)	7.1	21.6	**9.6**	9.3
Mean	68.3	63.0	**66.0**	66.4
Standard Deviation	13.2	16.1	**13.8**	13.9
CHEMISTRY 30			**N = 7 209**	**N = 6 750**
A (80-100%)	26.1	18.8	**20.6**	22.2
B (65-79%)	37.8	30.7	**35.4**	36.9
C (50-64%)	29.5	30.6	**35.0**	33.2
F (0-49%)	6.6	19.9	**9.0**	7.7
Mean	69.2	63.9	**66.9**	67.8
Standard Deviation	13.4	16.3	**14.0**	13.7
PHYSICS 30			**N = 3 127**	**N = 2 809**
A (80-100%)	30.2	22.6	**24.1**	20.0
B (65-79%)	36.6	26.5	**33.5**	37.3
C (50-64%)	28.1	29.6	**33.8**	34.1
F (0-49%)	5.1	21.3	**8.6**	8.6
Mean	70.5	64.1	**67.7**	67.0
Standard Deviation	13.5	17.1	**14.4**	13.9
SCIENCE 30			**N = 349**	**N = n/a**
A (80-100%)	8.6	14.6	**9.7**	n/a
B (65-79%)	39.3	35.6	**39.0**	n/a
C (50-64%)	42.1	33.8	**44.7**	n/a
F (0-49%)	10.0	16.0	**6.6**	n/a
Mean	64.0	63.9	**64.4**	n/a
Standard Deviation	11.4	14.4	**11.2**	n/a

* *The figures may change slightly as a result of appeals of school-awarded marks, rereads of diploma examinations, or special cases considerations.*

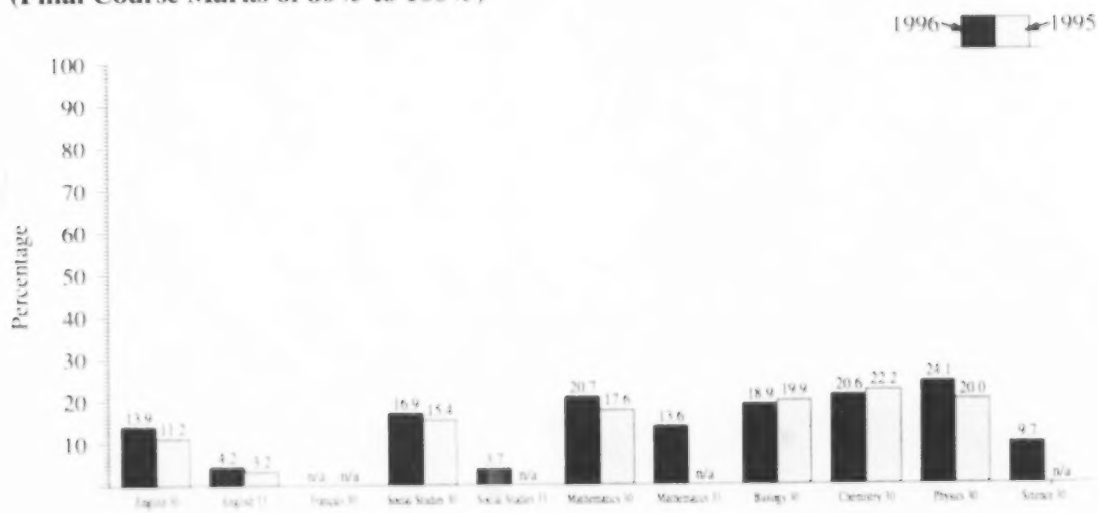
Diploma Examination Courses
Final Course Marks

January 1996 and January 1995

Percentage of Students Achieving Acceptable Standard
(Final Course Marks of 50% to 100%)



Percentage of Students Achieving Standard of Excellence
(Final Course Marks of 80% to 100%)



Percentage Distribution of Marks in Diploma Examination Courses

Diploma Examination Course	June 1996 School-Awarded Mark	June 1996 Diploma Examination Mark	June 1996 **Final Course Mark**	*June 1995 Final Course Mark*
ENGLISH 30			***N** = 12 675***	***N* = 13 558***
A (80-100%)	21.2	16.8	**16.8**	14.3
B (65-79%)	43.5	39.1	**44.0**	41.5
C (50-64%)	29.6	34.6	**35.4**	39.1
F (0-49%)	5.7	9.5	**3.8**	5.1
Mean	68.4	66.4	**67.8**	66.4
Standard Deviation	12.5	13.1	**11.5**	11.8
ENGLISH 33			***N* = 6 290***	***N* = 6 465***
A (80-100%)	5.8	7.3	**4.6**	3.5
B (65-79%)	33.6	39.6	**37.7**	34.6
C (50-64%)	46.1	38.3	**49.1**	52.9
F (0-49%)	14.5	14.8	**8.6**	9.0
Mean	60.6	62.7	**62.2**	61.3
Standard Deviation	12.2	12.3	**10.5**	10.1
FRANÇAIS 30			***N* = 44***	***N* = 80***
A (80-100%)	11.4	9.1	**4.5**	7.5
B (65-79%)	61.4	34.1	**56.9**	48.7
C (50-64%)	22.7	54.5	**38.6**	42.5
F (0-49%)	4.5	2.3	**0.0**	1.3
Mean	69.2	65.0	**67.3**	66.4
Standard Deviation	9.3	9.7	**8.3**	9.6
SOCIAL STUDIES 30			***N* = 10 703***	***N* = 11 158***
A (80-100%)	23.6	18.4	**19.3**	17.4
B (65-79%)	39.8	33.0	**37.4**	36.7
C (50-64%)	31.7	30.9	**36.4**	39.2
F (0-49%)	4.9	17.7	**6.9**	6.7
Mean	68.9	64.6	**67.1**	66.4
Standard Deviation	12.6	15.2	**13.0**	12.7
SOCIAL STUDIES 33			***N* = 6 929***	***N* = n/a***
A (80-100%)	5.1	8.3	**4.3**	n/a
B (65-79%)	31.8	38.4	**37.0**	n/a
C (50-64%)	49.2	35.5	**48.3**	n/a
F (0-49%)	13.9	17.8	**10.4**	n/a
Mean	60.4	62.1	**61.7**	n/a
Standard Deviation	11.5	13.3	**10.9**	n/a

**N = the number of Alberta students who have both a school-awarded mark and a current diploma examination mark.*

June 1996

Diploma Examination Course	School-Awarded Mark	Diploma Examination Mark	**Final Course Mark**	*June 1995 Final Course Mark*
MATHEMATICS 30			***N* = 9 342***	***N = 9 831***
A (80-100%)	23.8	16.6	**18.2**	19.2
B (65-79%)	32.4	23.5	**28.5**	28.7
C (50-64%)	33.0	28.9	**37.1**	36.3
F (0-49%)	10.8	31.0	**16.2**	15.9
Mean	67.0	59.5	**63.6**	64.0
Standard Deviation	14.8	18.8	**15.9**	15.9
MATHEMATICS 33			***N = 5 530***	***N = n/a***
A (80-100%)	11.6	17.6	**13.0**	n/a
B (65-79%)	30.1	27.4	**31.8**	n/a
C (50-64%)	40.2	29.3	**37.4**	n/a
F (0-49%)	18.1	25.7	**17.8**	n/a
Mean	61.4	61.6	**62.0**	n/a
Standard Deviation	14.3	17.4	**14.7**	n/a
BIOLOGY 30			***N = 9 585***	***N = 9 366***
A (80-100%)	27.7	17.9	**20.9**	26.4
B (65-79%)	36.7	26.9	**32.3**	32.5
C (50-64%)	28.5	28.9	**35.1**	31.0
F (0-49%)	7.1	26.3	**11.7**	10.1
Mean	69.3	61.8	**65.9**	68.0
Standard Deviation	13.8	17.2	**14.7**	15.0
CHEMISTRY 30			***N = 8 225***	***N = 8 106***
A (80-100%)	27.6	16.6	**20.4**	21.4
B (65-79%)	36.1	32.6	**36.5**	37.0
C (50-64%)	28.2	31.4	**32.6**	31.7
F (0-49%)	8.1	19.4	**10.5**	9.9
Mean	69.2	63.3	**66.6**	67.0
Standard Deviation	14.4	15.9	**14.4**	14.3
PHYSICS 30			***N = 4 884***	***N = 4 925***
A (80-100%)	35.2	26.7	**27.7**	32.0
B (65-79%)	37.7	27.5	**35.7**	36.2
C (50-64%)	22.0	24.0	**27.3**	25.5
F (0-49%)	5.1	21.8	**9.3**	6.3
Mean	72.3	65.2	**69.0**	71.0
Standard Deviation	13.6	18.9	**15.2**	14.4
SCIENCE 30			***N = 625***	***N = n/a***
A (80-100%)	7.7	7.0	**6.4**	n/a
B (65-79%)	34.2	28.5	**30.1**	n/a
C (50-64%)	43.1	40.5	**51.0**	n/a
F (0-49%)	15.0	24.0	**12.5**	n/a
Mean	61.5	59.4	**60.8**	n/a
Standard Deviation	12.9	13.5	**11.8**	n/a

**N = the number of Alberta students who have both a school-awarded mark and a current diploma examination mark.*

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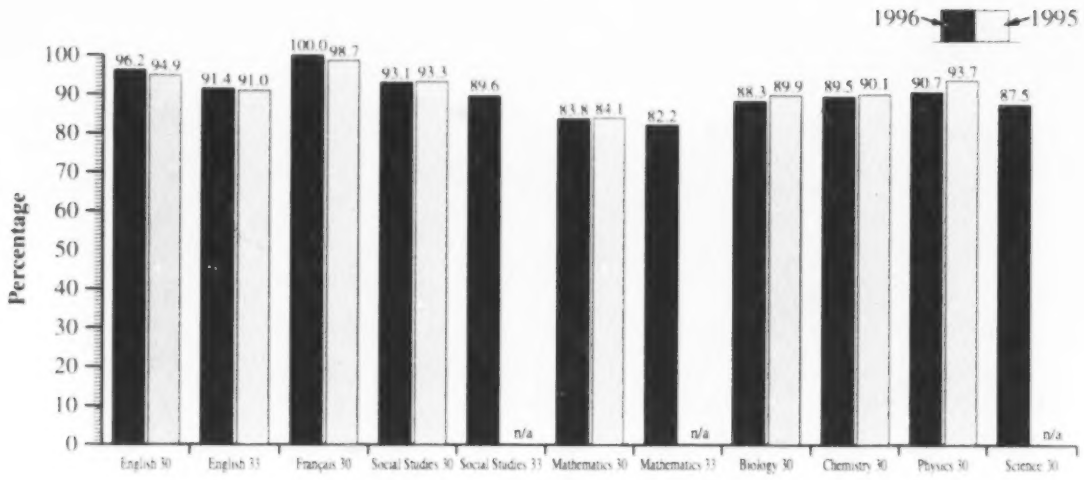
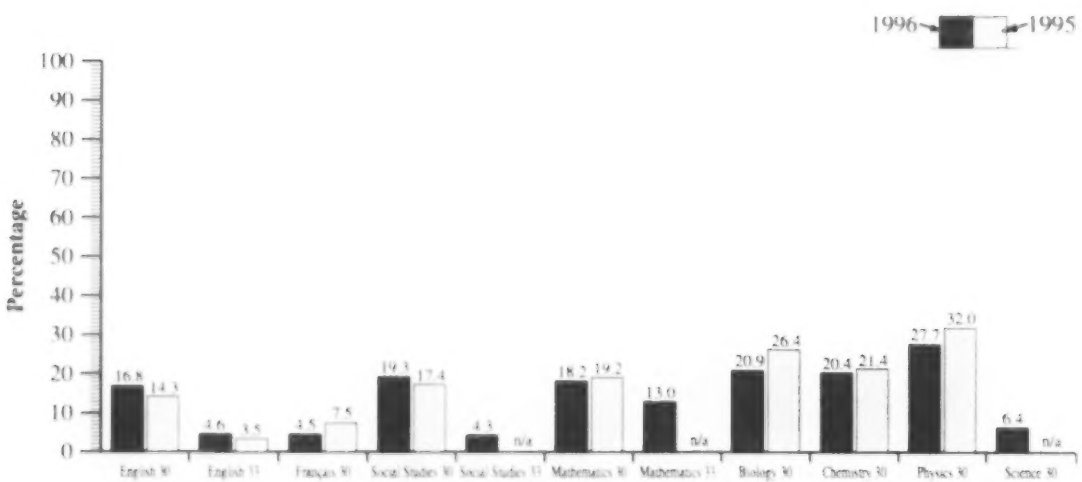
Diploma Examination Courses
Final Course Marks

June 1996 and June 1995

Percentage of Students Achieving Acceptable Standard
(Final Course Marks of 50% to 100%)



Percentage of Students Achieving Standard of Excellence
(Final Course Marks of 80% to 100%)



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